

MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. VI

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LIPPIA ORIGANOIDES H.B.K.

Slender very aromatic shrub or shrubby tree, to 3 m. tall, much-branched, weak and spreading or erect, with a sagebrush odor; stems fruticose; branches woody, subterete, striate, hirtous-pubescent, subcanescent; leaves decussate-opposite, aromatic, petiolate; petioles subterete, about 8 mm. long, subcanaliculate above, hirtous-pubescent; leaf-blades green or deep-green above, silvery-gray beneath, membranous but rather rigid, lanceolate or ovate-oblong, 1.8--6 cm. long, 0.6--3 cm. wide, acute to obtuse at the apex, crenate or denticulate along the margins, rounded at the base, rugose and pilose-hirtous above, puberulent to softly hirtous-tomentose and canescent beneath, often very densely white-tomentose, reticulate-venose; midrib and secondaries prominent beneath; inflorescence axillary, whorled, showy, 4--6 per leaf-axil, pedunculate; peduncles 4--5 mm. long, pubescent; heads ovate-tetragonal, 4--6 mm. long, much shorter than the subtending leaves, slightly surpassing the petioles; flowers small, showy, sessile in the bractlet axil, in 4 series, about 4 mm. long, with a sagebrush odor; bractlets ovate, in 4 series, imbricate, acute at the apex, shorter than the flowers, 3--5-veined, pubescent on the back, ciliate along the margins; calyx ovate, compressed, bifid, somewhat pilose, ciliate, the lobes equal, 2-toothed at the apex; corolla hypocrateriform or subhypocrateriform, white or dull-white to whitish, pilosulous on the outside, the tube usually pale-yellow, terete, inflated at the center, 3 times as long as the calyx, the limb 2-lipped, flat, the upper lip emarginate, the lower lip twice as long, 3-fid, the lobes rounded, the middle one larger; stamens didynamous, inserted in the swollen part of the corolla-tube, included; filaments very short; anthers didymous, compressed; style capillary, glabrous, half as long as the corolla-tube; stigma obliquely capitate; ovary glabrous, ovate; fruit obliquely obovate, subcompressed, 2-celled, 2-parted, smooth, glabrous, fuscous, minute, covered by the calyx, the cells 1-seeded, one seed often aborted.

The type of this common northern South American species was collected in September by Friedrich Heinrich Alexander von Humboldt and Aimé Jacques Alexandre Bonpland on dry hills near Punta Araya in the Cumana region, Sucre, Venezuela. The type of L. berterii was collected by Carlo Giuseppe Bertero in Magdalena, Colombia, and deposited in the herbarium of the Botanisches Museum at Berlin, where it was photographed by Macbride as his type photograph number 17496, now destroyed. The so-called L. organoides var. sampaionis Hert. is a synonym of L. salviaefolia Cham.

Lippia organoides has been found in thickets, among bushes, along roadsides, in full exposure to the sun on savannas, the lower slopes of mountains, dry hills, dry steep slopes, southwest-facing

slopes bordered by hilly savannas, and semi-deserts, from sea-level to 2300 meters altitude, flowering from April to February, fruiting in September and November. Curran & Haman report it "common on lower mountain slopes" in Venezuela, where Maguire and his associates call it "locally subdominant in savannas", "locally frequent on open hilltops", "frequent on roadsides", "frequent on granitic lava", and "frequent in grassy areas". In Colombia it is said by Haught to be "very abundant on limestone soil", by Langenheim "common in sandy rocky floodplain areas of thorn forest", and by Smith "common in dry scrubby growth in rocky (sometimes sandy) land near the sea or a few miles inland".

The flowers are described as "white" on Alston 6378, Curran & Haman 1150a, Haught 3887 & 6644, Killip 37233, Langenheim 3087, Maguire, Wurdack, & Bunting 35970, H. Pittier 9671 & 10542, H. Saint John 20718, Sandeman 5991, and H. H. Smith 587, as "dull-white" on Steyermark 58601, as "whitish" on Tamayo 4147, and as "white, the tube pale yellow" on Wurdack & Monachino 40974. Vernacular names recorded for the plant are "chara-ceur", "oreganillo", "oregano", "orégano", "orégano cimarrón", "orégano de burro", "oregano del país", and "poleo". Calpouzos (1954) points out that the names "oregano", "oregeno", "origano", or "oragano" are applied also to L. affinis Schau., L. formosa T. S. Brandeg., L. fragrans Turcz., L. graveolens H.B.K., L. micromera Schau., L. micromera var. helleri (Britton) Moldenke, L. palmeri S. Wats., L. palmeri var. spicata Rose, Lantana involucrata L., L. achyranthifolia Desf., L. trifolia L., Coleus amboinicus Lour., Hedeoma floribunda Standl., H. patens Jones, Hyptis albida H.B.K., H. americana (Aubl.) Urb., H. capitata Jacq., H. suaveolens (L.) Poit., Limnophila stolonifera (Blanco) Merr., Monarda austromontana Epl., Ocimum basilicum L., Origanum vulgare L., O. majorana L., Polio-mintha longiflora Gray, and Salvia sp.

Pittier reports the plant as medicinal in Venezuela, where Tamayo states that the leaves are used as a condiment to give a pleasant taste with meats, and Steyermark reports that the leaves are boiled in water with guarapo (a sugar drink) and used against colds.

Material of this species has been misidentified and distributed in herbaria under the names L. affinis Schau., L. alba (Mill.) N. E. Br., L. graveolens H.B.K., Lantana involucrata L., Lantana cfr. salvifolia Jacq., and Lantana sp. On the other hand, the Kuntze s.n. [Sta. Cruz, 1000 m., V.92], distributed as L. organoides, is L. affinis Schau.; H. H. Rusby 704, Saer 196, and O. E. White 905 are L. alba (Mill.) N. E. Br.; J. F. de Castro 75, P. Clausen s.n. [Aug.—April 1840], Freire & Zeredo s.n. [Herb. Rio de Jan. 31563], Gehrt & Hoehne s.n. [Herb. Inst. Bot. S. Paulo 17462], Herb. Inst. Bot. S. Paulo 31301, F. C. Hoehne s.n. [Herb. Inst. Bot. S. Paulo 4859] & Com. Rondon 1307, Löfgren 248, Pizarro 118, and Regnell III.

942 are L. elegans Cham.; G. F. Gaumer 832 and Edw. Palmer 2771 are L. graveolens H.B.K.; R. S. Williams 307 is the type collection of L. pendula Rusby; Ule s.n. [Herb. Rio de Jan. 31635] is L. rubiginosa Schau.; and another P. Clausen s.n. [Aug.--April 1840] and Regnell III.942 [3/5/1847] & III.942 [25/10/1848] are L. sidoides Cham. The Gray Herbarium sheet of Lehmann B.T.818 is Phylla nodiflora var. canescens (H.B.K.) Moldenke.

Schauer (1847) places this species in his Section Goniostachyum and regards it as conspecific with L. elegans Cham. of Brazil. Steudel (1840) and Walpers (1845) give Gardoquia organoides as a synonym of Lippia organoides, but actually Reichenbach's name applies to L. micromera Schau., as has been proved by examination of the type in the Sieber herbarium. Schauer (1851) cites a P. Clausen 1037, J. E. Pohl s.n. [ad Correa et Formigas], L. Riedel s.n. [Villa Rica], and Sellow s.n. [Villa Rica] from Minas Gerais, and a J. E. Pohl s.n. [in monte Serra do Caxeiro] from Gofas, but these collections are doubtless all to be referred to L. elegans. He cites also an unnumbered Otto collection from Venezuela, which is probably correctly placed. Hayek (1908) cites Wacket s.n. [in circuitu urbis Sorocaba] from São Paulo, and Martínez (1937) records the species from Tabasco and Yucatán, Mexico—both identifications doubtless erroneous.

In all, 93 herbarium specimens of L. organoides and 9 mounted photographs, including phototypes of all the names involved, have been examined by me.

Citations: MARGARITA ISLAND: Ginés 2768 (W--2174229), 3069 (W--2174388). COLOMBIA: Cundinamarca: H. García Barriga 4875 (W--1594225). Magdalena: Araque Molina & Barkley 18Mg088 (Es, N), 18Mg089 (N); Bertero s.n. [Macbride photos 17496] (It--photo, Kr--photo, N--photo, N--photo, W--photo); H. M. Curran 380 (Ew), s.n. [June 1916] (W--537602); Dawe 499 (W--1423276); Haught 3887 (N, S), 6644 (Hw); H. H. Smith 587 (Br, Cm, N, Vt, W--533081). Nariffo: Garganta Fábregas 538 (F--1292036); Triana s.n. [Pasto] (W--1481423). Norte de Santander: Araque Molina, Otálora, & Barkley 18NS043, in part (N); Garganta Fábregas 1119 (F--1294538), 1130 (F--1294530). Santander: Herb. Hort. Bot. Reg. Kew. s.n. (N); Langenheim 3087 (W--2266580); H. Saint John 20718 (N, N); Sandeman 5991 (K). State undetermined: Lehmann B.T.818, in part (N); Otto 456 (Br); Triana s.n. (Hn). VENEZUELA: Bolívar: H. M. Curran 199m (N), 213m (N); Killip 37233 (N, Ve--12761, W--1855376); Lasser & Vareschi 2779 (Ve); B. Maguire 32657 (N, S); Maguire, Wurdack, & Bunting 35868 (N), 35970 (N), 35997 (N), 36021 (N); T. A. Sprague s.n. [Ciudad Bolívar, Nov. 1898] (K); Steyermark 57640 (F--1221918, N), 58601 (N); Tamayo 3122 (W--1906651), 3474 (Ve, Ve); Wurdack 34376 (N); Wurdack & Guppy 23 (N); Wurdack & Monachino 40974 (N).

Carabobo: Curran & Haman 1150 (W--1011124), 1150a (N, W--1043443).
 Falcón: Curran & Haman 606 (N, W--1043286); Lasser & Foldats 2956
 (Ve--36554); Tamayo 975 (Ve--12750), 976 (W--1778313). Federal
 District: Boldingh 3947 (Ut--115369b); Curran & Haman 966 (N, W--
 1043381); H. Pittier 8096 (Ve, W--988197), 9671 (Ba, N, Ve--12752,
 Vi, W--1120735); Robinson & Lyon s.n. [July 13, 1900] (W--531799);
Rose & Rose 21723a (W--763440). Guárico: Tamayo 4147 (W--2221008).
 Lara: Alston 6378 (S, W--2440228); Marcuzzi s.n. [Barquisimeto]
 (N); Saer 62 (Ve, W--1189690); Tamayo 326 (N, Ve, W--1744865),
3750 (N). Miranda: H. Pittier 8251 (Ve, W--988352). Sucre:
Humboldt & Bonpland s.n. [Macbride photos 39482] (It--photo of
 type, Kr--photo of type, N--photo of type, W--photo of type).
 Zulia: H. Pittier 10542 (N, Ve--12751, Vi, W--1187219). BRAZIL:
 Rio Branco: Maguire & Maguire 40022 (N, S), 40377 (N). CULTIVA-
 TED: Cuba: Calvino 107 (N). Venezuela: Tamayo 4624 (Ve--55933).

LIPPIA OXYCNEMIS Schau. in A. DC., Prodr. 11: 589. 1847.

Synonymy: Lippia oxycnemis Schau. ex Moldenke, Alph. List In-
 valid Names Suppl. 1: 15, in syn. 1947.

Bibliography: Schau. in A. DC., Prodr. 11: 589. 1847; Schau.
 in Mart., Fl. Bras. 9: 244. 1851; Hiern, Vidensk. Meddel. Kjöbenh.
 1877-1878: 99. 1877; Jacks. in Hook. f & Jacks., Ind. Kew. 2: 95.
 1894; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 542. 1911; Molden-
 ke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Mol-
 denke, Alph. List Invalid Names Suppl. 1: 15. 1947; Moldenke,
 Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; H. N. &
 A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke,
 Alph. List Cit. 3: 689, 824, & 969 (1929) and 4: 1105, 1135, &
 1205. 1949; Moldenke in Dawson, Los Angeles Co. Mus. Contrib. Sci.
 7: 11. 1957; Moldenke, Résumé 94, 316, & 462. 1959; Rennó, Levant.
 Herb. Inst. Agron. Minas 150. 1960; Moldenke, Phytologia 12: 24
 & 102. 1965.

Suffruticose or an erect shrub, to 3 m. tall, with very vari-
 able pubescence, sometimes subvillous-hirsute, sometimes hirtous,
 sometimes strigillose; stems erect, tetragonal, hirsute; leaves
 decussate-opposite or ternate, rigid; petioles short, hirsute;
 leaf-blades stiff, paler beneath, elliptic or oblong, acute at
 the apex, attenuate into the petiole at the base, crenate-serrate
 along the margins except for the entire base, penninerved, rugose,
 strigose-hirtous or hirsute above with often bulbous-based hairs,
 tomentose beneath, hirtous or villous-hirsute on the venation be-
 neath; panicle terminal, cymose, its branches opposite or verti-
 cillate, mostly simple, sometimes dichotomous; heads squarrose,
 strobiliform, globose or ovoid; bractlets lilac, scale-like, cus-
 pidate at the apex, ovate at the base, sericeous or pubescent-
 strigose on the back, closely imbricate, equaling the corolla-
 tube; calyx very short, shortly bifid, villous; corolla hypocra-
 teriform, rose, rose-pink, or pink to violet, violet-lilac [as in

Euphrasia officinalis L.], or lilac, or even blue, 4 mm. long, villous-pubescent on the outside, the tube clavate-infundibular, somewhat incurved, the throat yellow, the limb with its lowest lobe transversely oblong, truncate, reflexed, the rest very short.

This distinct species was based by Schauer on several collections made by Johann Emanuel Pohl (apparently under his no. 137) at Caretão, Pillão, Cruxas, and Trahiras, in Goiás, Brazil, deposited in the herbarium of the Botanisches Museum at Berlin, where one of them was photographed by Macbride as his type photograph number 17530, now destroyed. In his 1851 publication Schauer cites Martius s.n. [Contendas] from Minas Gerais, Martius s.n. [Caitete] from Bahia, and J. E. Pohl s.n. [Otho d'Agua, Alegres, Caretão, Pilar Cruxas, Trahiras]. He places the species in his Section Zapania, Subsection Paniculatae, and says: "Lippiae vernonioidi Cham. proxime affinis et valde similis, bractearum figura potosimum diversa." Of the inflorescence he says: "Paniculae rami saepius simplices sunt, quo illa racemosa evadit, capitulis ad apicem compactis plerumque vero pedunculis unus alterve progreditur ad basin capituli terminalis, tunc alaris et sessilibus, quo panicula dichotoma, magis minusve expansa fit." He also says "pilis in supera pagina foliorum basi callosis vel ecallosis."

The flowers are described as "rose-pink" on Mexia 5677, as "rose" on Williams & Assis 7206, as "pink" on Warming 174, as "blue" on Williams & Assis 7046, as "lilac" on E. Santos 1630, as "violet" on Mendes Magalhães 3311, and as "violet-lilac [as in Euphrasia officinalis], throat yellow" by Hiern. The plant has been found growing on campos, in low damp ground, and in cerrado, at altitudes of 590 to 1300 meters, flowering from April to July, although Schauer says "July--October". Mexia describes it as "frequent". Vernacular names are "fruta de cobra", "marmique", and "marmiqué". In all, 29 herbarium specimens and 6 mounted illustrations, including phototype material of both names involved, have been examined by me.

Citations: BRAZIL: Brasilia: Murça Pires, Silva, & Souza 9285 (LW); E. Santos 1630 [Sacco 1863; Herb. Brad. 27093] (N). Goiás: E. Y. Dawson 11429 (Z); Glaziou 21899 (Br); J. E. Pohl 137 [Macbride photos 17530] (Kr--photo of cotype, N--photo of cotype, N--photo of cotype, N--photo of cotype, W--photo of cotype). Minas Gerais: P. Clausen 637 (S); Mendes Magalhães 3311 [Herb. Jard. Bot. Belo Horiz. 42341] (N), 3312 [Herb. Jard. Bot. Belo Horiz. 42337 & 42340] (N, N), 4323 [Herb. Jard. Bot. Belo Horiz. 45129] (N); Mexia 5677 (Au--121210, En, Gg--286681, Go, I, Ky, Mi, N, N, N, S, W--1705022); Stephan s.n. [Congonhas do Campo, 1843] (Br); Warming 174 (S), s.n. [Lagoa Santa] (N); Williams & Assis 7046 (G, N, S), 7206 (G, N). MOUNTED ILLUSTRATIONS: J. E. Pohl, Icon. Plant. Brasil. 301 (V--drawing).

LIPPIA OXYPHYLLARIA (Donn. Sm.) Standl., Field Mus. Publ. Bot. 18: 1010. 1938.

Synonymy: *Lippia substrigosa* var. *oxyphyllaria* Donn. Sm., Bot. Gaz. 23: 249. 1897.

Bibliography: Donn. Sm., Bot. Gaz. 23: 249. 1897; P. C. Standl., Field Mus. Publ. Bot. 18: 1010. 1938; Moldenke, Alph. List Common Names 7. 1939; Moldenke, Prelim. Alph. List Invalid Names 32. 1940; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 27: 335. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 23, 24, & 96. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Phytologia 2: 69 & 107. 1945; Moldenke, Alph. List Cit. 1: 7. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Cit. 2: 389 (1948), 3: 818 & 821 (1949), and 4: 999, 1120, & 1133. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 41, & 190. 1949; Dayton, Phytologia 4: 259. 1953; Moldenke, Résumé 47, 48, 317, & 462. 1959.

Shrub or small tree, to 6.5 m. tall; trunk to 7.5 cm. in diameter; stems terete; branches terete, densely pilose; leaves decussate-opposite, petiolate; leaf-blades rather thick-textured, oblong-elliptic or elliptic to lance-oblong or lanceolate-elliptic, mostly 6--9 cm. long, acute or acuminate at the apex, acuminate or cuneate at the base, often contracted and decurrent, closely crenate along the margins, rugose, densely short-pilose and asperulous above, more densely and softly pilose beneath; secondaries and veinlet reticulation very prominent; heads usually 2 in each leaf-axil, subglobose, 2.5 cm. wide; peduncles long and recurved; heads with the rachis to 1.6 cm. long; bractlets large, broadly ovate or ovate-lanceolate, 1.6--1.8 cm. long, accrescent in age, the outer ones long-acuminate at the apex; corolla hypocrateriform, white, greenish-white, or yellow.

This species was based on two collections — one made by Henri François Pittier de Fábrega (no. 3951) at the borders of the forest at Terrabe, Puntarenas, Costa Rica, at an altitude of 800 feet, in February, 1891, and the other by Adolfe Tonduz (no. 6667) in thickets along the river Ceibo near Buenos Ayres, in the same province, at 1000 feet altitude, Costa Rica, in February, 1892. Smith (1897) compares this taxon with *L. substrigosa* Turcz., of which he regarded it as a variety, as follows: "The typical form of the species seems to be represented by the following specimens from Guatemala, which differ from the above by tetragonal branches, ovate leaves abruptly contracted into petiole, peduncles several in the axes, orbicular-ovate bracteoles: nos. 2006, 4387, 4389 Pl. Guat., etc., qu. ed. Sonn. Sm.; no. 3610 Nelson."

This endemic Costa Rican and Panamanian species has been found on llanos at altitudes of 240 to 1300 meters, flowering from December to March, fruiting in January, February, and April. A common name recorded for it is "caragra", erroneously listed by me previously as applying to *L. substrigosa* Turcz.

The flowers are described as "white" on Tonduz 6667, "greenish-white" on R. S. Williams 151, and "yellow" on P. H. Allen 1541. Material has been misidentified and distributed in herbaria as *L.*

substrigosa. Standley (1938) says "It is probable that most of the material reported from Costa Rica as L. umbellata Cav. is referable to this endemic species, which is distinguished from other local species by the broad heads with accrescent bracts."

In all, 13 herbarium specimens, including type material of both names involved, have been examined by me.

Citations: COSTA RICA: Puntarenas: H. Pittier 3951 (Br--cotype); Pittier & Tonduz s.n. [Herb. Inst. Physico-geogr. Nat. Costaric. 10632] (Br); Tonduz 6667 (Br--cotype, Br--cotype). PANAMA: Chiriquí: P. H. Allen 1008 (E--1121190, G, N), 1541 (G, N); H. Pittier 5387 (N); P. White 332 (G, N). Coclé: R. S. Williams 151 (N). Veraguas: P. H. Allen 155 (A).

LIPPIA PALMERI S. Wats., Proc. Am. Acad. 24: 67. 1889.

Synonymy: Lippia greggii M. E. Jones ex Moldenke, Suppl. List Invalid Names 5, in syn. 1941. Lippia palmeri var. palmeri [Moldenke] in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1255. 1964.

Bibliography: S. Wats., Proc. Am. Acad. 24: 67. 1889; Durand & Jacks., Ind. Kew. Suppl. 1: 250. 1903; Goldman, Contrib. U. S. Nat. Herb. 16: 362. 1916; M. Martínez, Cat. Nom. Vulg. & Cientif. Pl. Mex., [ed. 1]. 1923; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1244 & 1245. 1924; I. M. Johnst., Proc. Calif. Acad. Sci., ser. 4, 12 (2): 1152. 1924; M. Martínez, Cat. Nomb. Vulg. & Cientif. Pl. Mex., [ed. 2], 339. 1937; Moldenke, Suppl. List Common Names 16. 1940; Moldenke, Suppl. List Invalid Names 5 & 6. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527: 30, 45, 58, 59, 223, & 306. 1942; Moldenke, Alph. List Invalid Names 30 & 32. 1942; Moldenke, Phytologia 2: 107. 1945; M. Martínez, Bol. Soc. Bot. Mex. 2: 2 & 13. 1945; Moldenke, Alph. List Cit. 1: 17 & 233. 1946; Moldenke, Phytologia 2: 330. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 62 & 74. 1948; Moldenke, Alph. List Cit. 2: 474, 477, 489, & 595 (1948), 3: 786, 787, 873, 931, & 933 (1949), and 4: 1126, 1181, 1238, 1240, 1241, & 1247. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 190. 1949; H. S. Gentry, Allan Hancock Pacif. Exped. 13 (2): 87, 98, 113, & 241. 1949; Shreve & Wiggins, Carnegie Inst. Wash. Publ. 591: 94. 1951; Calpouzos, Econom. Bot. 8: 222, 224, 226--228, 230, & 232, fig. 4. 1954; B. H. Johnson, Wasmann Journ. Biol. 16: 295. 1958; Moldenke, Résumé 37, 313, 316, & 462. 1959; Moldenke, Résumé Suppl. 3: 10. 1962; Moldenke in Shreve & Wiggins, Veg. & Fl. Son. Des. 2: 1255. 1964; Langman, Select. Guide Lit. Flow. Pl. Mex. 177 & 1010. 1964; Moldenke, Phytologia 12: 47, 63, 162, 164, 190, & 283. 1965.

Illustrations: Calpouzos, Econom. Bot. 8: 227, fig. 4. 1954.

A small, low, rounded, bushy, much-branched, and twiggy shrub, 0.5--2 m. tall, slender, erect, open, with a strong sage-like or pungent odor and highly odorous herbage; branches many, slender or very slender, short, irregular, tetragonal, appressed-pubescent; branchlets and twigs very numerous; nodes annulate; principal in-

ternodes 0.5--1 cm. long; leaves decussate-opposite, richly aromatic, with a strong sage-like odor; petioles filiform, 1--5 mm. long, appressed-pubescent; leaf-blades ovate or rounded-ovate to elliptic, 1--2.5 cm. long, 3--10 mm. wide, obtuse or rounded to subacute at the apex, usually decurrent into the petiole at the base, subcrenate or coarsely crenate along the margins, scaberulous or rugose above and finely substrigose, more densely appressed-pubescent and resinous-punctate beneath; midrib slender, often impressed above and prominent beneath; secondaries about 3 pairs, short, often impressed above and prominent beneath; peduncles solitary or in pairs in the leaf-axils, very short and inconspicuous, 1--3 mm. long, substrigose; spikes capitate, 4--13 (usually only 4--9) mm. long, often few-flowered and loose; bractlets often pink, decussate, the lower ones united to the middle, the upper distinct, ovate, 3--4 mm. long, acute or acuminate at the apex, densely appressed-pubescent, more or less resinous-dotted; calyx thin, not carinate; corolla white or cream-color to pale-lavender, lavender-white, or deep lavender-rose, turning yellow, pink, or rose in age, hypocrateriform, its tube about 4 mm. long, densely appressed-pubescent and more or less resinous-dotted outside, the limb about 3 mm. wide, the lobes puberulent toward the base outside, otherwise glabrous.

This species was based by Watson on three collections made by Edward Palmer (nos. 277, 643, & 644) -- in whose honor it was named -- at Guaymas, Sonora, Mexico; H. S. Gentry 4685 is said to be a topotype. The type of L. greggii was collected by Marcus Eugene Jones (no. 22581) also in Sonora, deposited in the Dudley Herbarium.

The species has been collected along arroyos, in basaltic clay soils on open slopes and mesas, on foothills and dry hills, arid hilltops, low hills and flats, low open ridges of granite rocks and sand, and low open dry ridges (granitic) between jungle-like sandy flats, rocky hillsides, rocky ground behind dunes, south-facing canyon slopes, and forested sandy valley bottoms. In Shreve & Wiggins (1964) its distribution is given as "In gravelly or basaltic, clay soils and rocky sand or sandy bottom soil, on dry open hills and mesas, rocky benches, and the drier lower slopes of hills, Lower Sonoran Zone, Magdalena Island and the adjacent peninsula, Baja California, to central Sonora and Sinaloa." Johnston reports it as "frequent in sandy washes or in small draws", while Carter & Ferris found it "on north-facing rocky slope with Bursera microphylla, Jatropha cuneata, Lemaireocereus thurberi, and some Pachycereus pringlei" and "on north-facing slope with Lysiloma candida, Mimosa purpurascens, Jatropha cinerea, Sapium biloculare, Jacquemontia, and Ruellia". Carter, Alexander, & Kellogg found it "among Larrea and Krameria with scattered Pachycereus, in broad arroyo in coastal area".

Gentry (1942) describes it as dominant or abundant on slopes and mesas of the thorn forest, and as "A low caespitose shrub with numerous short, slender, irregular branches. Southwest of Alamos on rol-

ling, open, sun-baked mesas it forms abundant open-spaced stands mixed with other shrubs, and the locality is redolent with the rich, aromatic odor of the herbage. The highland oréganos belong to different families, though the flavor and odor of them is characteristically similar. As with the highland species, Lippia Palmeri is used by the Mexicans and Indians for seasoning meats, and is very excellent indeed." He records it from the "Thorn Forest, with maximum stature of 2--4 feet, 334 per acre, 10 miles east of Navojoa, hill slope to sandy bottom, exposure southeast, gradient 3 to 10 percent; soil rocky sand and some sandy bottom soil; elevation 500 feet." He also gives its occurrence as "708 per acre.....west exposure, gradient about 6 percent; soil gravelly" and reports it as a characteristic plant on canyon and mountain slopes in the short-tree forest. Martínez (1945) says that it is called "orégano" in the region of Miraflores, and "es planta aromática muy apreciada como condimento. Mide de uno a dos metros, con hojas de 15 a 20 mm., con las florecillas blancas". The orégano of the Todos Santos region is Lippia formosa T. S. Brandeg. and that of Comondú and Mulegé is Aloysia barbata (T. S. Brandeg.) Moldenke. "Es objeto de exportación". Other authorities also report the use of Lippia palmeri as a potherb and the odorous herbage used as a condiment.

The species has been collected at altitudes of 50 to 665 meters, flowering from October to May and in July, fruiting in February and November. Variations in its common name are reported as "oregano", "orégano", and "origano". Calpouzos (1954) points out that this is only one of the plants called "oregano", "oregeno", "origano", or "oragano". Others are L. affinis Schau., L. formosa T. S. Brandeg., L. fragrans Turcz., L. graveolens H.B.K., L. micromera Schau., L. micromera var. helleri (Britton) Moldenke, L. organoides H.B.K., L. palmeri var. spicata Rose, Lantana achyranthifolia Desf., L. involucreta L., L. trifolia L., Coleus amboinicus Lour., Hedeoma floribunda Standl., H. patens Jones, Hyptis albida H.B.K., H. americana (Aubl.) Urb., H. capitata Jacq., H. suaveolens (L.) Poit., Limnophila stolonifera (Blanco) Merr., Monarda austromontana Epl., Ocimum basilicum L., Origanum vulgare L., O. majorana L., Policmintha longiflora Gray, and Salvia sp. He notes that "Oregano is becoming a popular herb in America. The botanical identity of the plants sold as oregano in the United States has been in doubt. Most of the plants belong to the genus Lippia, of the family Verbenaceae, and come from Mexico. The rest of our supply of this herb comes from Europe. These latter plants belong to the genus Origanum of the family Labiatae. Species in other genera are also called 'oregano', or some variation of this name, in many parts of the world. The term 'oregano' should not be used to refer only to a single plant species but rather to a number of species, all having in common a particular herb flavor."

The flowers of Lippia palmeri are described as white on A. Carter 260, H. S. Gentry 3007, and Hammerly 405, as "pink" on H. S. Gentry

4188 and R. V. Moran 4068, as "pale-lavender" on Carter & Ferris 3758, as "white to pale-lavender" on Carter & Ferris 4044, as "lavender-white to deep lavender-rose" on Carter, Alexander, & Kellogg 2476, and as "lavender to white, turning pink in age" on Wiggins 14432. Shreve 6130 is typical, with lovely pink bractlets, but the determination of his no. 6040 is doubtful.

Material of L. palmeri has been misidentified and distributed in herbaria under the names L. geminata H.B.K. and Hermannia pauciflora Wats. On the other hand, the T. S. Brandegees s.n. [Miraflores, Oct. 14, 1890], H. S. Gentry 4094, I. M. Johnston 4267, and Edw. Palmer 62, distributed as L. palmeri, are all var. spicata Rose, Nelson & Goldman 7220 and Wiggins 11379 are L. graveolens H.B.K., and M. E. Jones 23237 is Lantana scorta Moldenke. Carter, Alexander, & Kellogg 2476, H. S. Gentry 4188 & 4685, and M. E. Jones 24352 appear to be mixtures with var. spicata. The L. palmeri of Johnston (1924) is var. spicata.

In all, 84 herbarium specimens, including type material of both names involved, have been examined by me.

Citations: MEXICO: Baja California: T. S. Brandegees s.n. [Magdalena Bay, Jan. 12, 1889] (Ca--169676, G), s.n. [Sierra de la Trinidad, Nov. 1902] (Ca--50752, Vt); A. Carter 2667 (Ca--916209); Carter, Alexander, & Kellogg 2476, in part (Du--349124, G, Gg--381237, S); Carter & Ferris 4044 (Ca--199584, Gg); H. S. Gentry 4188, in part (Fs, G); Hammerly 405 (Du--295385, G, Gg--294852); M. E. Jones 24352, in part (A, Fs, La, N, Po--153954, Sd--25320); Rempel 44 (Ak--6651); Wiggins 11379 (Ca--758600, Du--321772), 14432 (Du--438443, G), 14443 (Du--438441, G), 15588 (G). Sinaloa: J. Gonzalez Ortega 5509 (Me); M. E. Jones 23234 (Ca--400874, En--6160, Gg--172664, N, Po--153957), 23236 (Po--153956); Rose, Standley, & Rose 13500 (N). Sonora: L. H. Bailey 137 (Ba); H. S. Gentry 3007 (Ca--582019, Fs, G, Ge, Gg--295379, Me, Me, S), 4685, in part (Ge); M. E. Jones 22581 (Du--229891, G, Po--162203, Po--191073), 23231 (Au, Au, Ca--400877, En--6142, G, Gg--172663, Hp, N, Po--162202); Edw. Palmer 277 (C--cotype, G--cotype, Pa--cotype), 643 (C--cotype, Pa--cotype), 644 (C--cotype, Ca--168509--cotype, G--cotype, Pa--cotype); Rose, Standley, & Rose 12712 (N); Shantz s.n. [8 Dec. 1931] (I); Shreve 6040 (Fs), 6130 (Cm, Fs); Wiggins 6347 (Ca--527859, Du--226237, M1). TIBURÓN ISLAND: R. V. Moran 4068 (Ca--1740, Du--363326). SAN MARCOS ISLAND: R. V. Moran 3982 (Ca--1381, Du--361716). CARMEN ISLAND: Carter & Ferris 3758 (Ca--199589, Z). TRES MARIAS ISLANDS: Maria Magdalena: T. S. Brandegees s.n. [Jan. 12, 1889] (Du--205074).

LIPPIA PALMERI var. SPICATA Rose ex Vasey & Rose, Contrib. U. S.

Nat. Herb. 1: 75. 1890.

Synonymy: Lippia palmeri spicata Rose, Contrib. U. S. Nat. Herb. 5: 227. 1899.

Bibliography: Vasey & Rose, Contrib. U. S. Nat. Herb. 1: 75. 1890; Rose, Contrib. U. S. Nat. Herb. 5: 227. 1899; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1245. 1924; I. M. Johnston., Proc. Calif. Acad. Sci., ser. 4, 12 (2): 1152. 1924; Moldenke, Suppl. List Common Names 16. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Phytologia 2: 107 (1945) and 2: 330. 1947; Moldenke, Castanea 13: 113 & 114. 1948; Moldenke, Alph. List Cit. 2: 474, 483, 593, & 595 (1948), 3: 933 (1949), and 4: 1121, 1126, 1235, 1236, 1242, 1244, & 1298. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31, 34, & 190. 1949; Calpouzos, Econom. Bot. 8: 228 & 230. 1954; Moldenke, Résumé 37, 40, & 462. 1959; Moldenke, Phytologia 12: 47, 162, 164, 190, & 283. 1965.

This variety differs from the typical form of the species in having its flower spikes 1--2.5 cm. long, more compact and conspicuous.

The plant is a twiggy bushy shrub or a small divaricately branched shrub, 1--1.5 m. tall; branches many, slender; corolla pink or lavender-white to deep lavender-rose. Rose (1890) says that "The flowers are arranged in spikes sometimes over an inch long and the whole inflorescence is more compact. It is called 'origaro' and is used in cooking much as thyme and sage is used in the United States, especially with fish and sausage, and sometimes in place of tea."

The type of this poorly defined variety was collected by Edward Palmer (no. 62) at La Paz, Baja California, Mexico, between January 20 and February 5, 1890, and is deposited in the United States National Herbarium at Washington as sheet number 46706.

The plant has been found in arid gravel soil in small tributary arroyos, on sandy forested valley bottoms, and along dry washes, wash banks, and the margins of paved highways, flowering from December to April and in June and July, fruiting in December, February, March, June, and July. Johnston refers to it as "frequent in sandy washes or small draws"; Carter, Alexander, & Kellogg found it "among Larrea and Krameria with scattered Pachycereus in broad arroyo in coastal mesa." Gentry reports it as "uncommon", used for seasoning and the highly odorous herbage used as a condiment. Common names recorded for it are "oregano", "orégano", and "origaro", but Calpouzos (1954) lists numerous other species in this and related groups to which these names are also applied -- for a list of these, see under the typical form of L. palmeri.

In Shreve & Wiggins (1964) the distribution of this variety is given as "In habitats similar to those of var. palmeri, Lower Sonoran Zone, in Baja California, Tiburón Island, and Sonora". Johnston (1924) says: "This is a frequent plant about Willards Point (4267) and along the southeast shore of Tiburón Island. It is a characteristic shrub on rocky benches and on the drier, lower slopes of the

hills, and forms a rounded bushy mass of many slender twiggy stems 6--10 dm. high. The collected specimens seem to have slightly smaller, less rugose, and less crenate leaves than do the other available collections of this species." Still he regarded his collection to represent the typical form of the species.

Material has been misidentified and distributed in herbaria under the names Lippia montana T. S. Brandeg. and Lantana sp. The Carter, Alexander, & Kellogg 2476, H. S. Gentry 4188 & 4685, and M. E. Jones 24352 appear to be mixtures with the typical form of the species.

In all, 34 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: MEXICO: Baja California: T. S. Brandegees s.n. [Miraflores, Oct. 14, 1890] (Ca--187476); Carter, Alexander, & Kellogg 2476, in part (Mi); H. S. Gentry 4094 (Ca--709115, Du--264840, G), 4188, in part (Ca--709158, Du--264882); M. E. Jones 24351 (La, Po--153955, Rs--11734, W--1635664), 24352, in part (Ca--400428, N), 24355 (Po--83959); Edw. Palmer 62 (Pa--isotype), 621 (G); Shreve 7184 (Du--263426, Fs, G, Mi, N); J. Whitehead 820 (Du--248580, La, N--photo, Z--photo); Wiggins 5539 (Du--263465), 14614 (Du--438442, G). Sonora: H. S. Gentry 4685, in part (N). TIBURÓN ISLAND: I. M. Johnston 4267 (A, Ca--251803, Du--166612, Du--188791, G, Gg--31206, N).

LIPPIA PEARSONI Moldenke, *Phytologia* 3: 120--121. 1949.

Bibliography: Moldenke, *Phytologia* 3: 120--121 & 137. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 119 & 190. 1949; E. J. Salisb., *Ind. Kew. Suppl.* 11: 138. 1953; Moldenke, *Résumé* 147 & 462. 1959; Moldenke, *Phytologia* 12: 232. 1965.

Shrub, 1.5--2 m. tall, many-stemmed, much-branched; stems suffrutescent, erect; branches rather stout, somewhat angular and ribbed, densely puberulent; branchlets and twigs usually ternate, slender, minutely puberulent or glabrescent, often ribbed; nodes not annulate; principal internodes 1--6.7 cm. long; leaves mostly ternate, very aromatic; petioles slender, 1--5 mm. long, pilosulous-puberulent; leaf-blades chartaceous, rather uniformly green on both surfaces, small, narrow-elliptic or lanceolate, 2--7 cm. long, 5--15 mm. wide, attenuate at both ends, very finely and rather obscurely serrulate along the margins, finely strigose and scabrous above, densely punctate beneath and strigose along the larger venation; midrib slender, subimpressed above, prominent beneath; secondaries very slender, 5--9 per side, ascending, slightly arcuate, subimpressed above, prominulous beneath; veinlet reticulation subimpressed above, only the larger parts distinct beneath; inflorescence axillary, spicate, usually 4--8 per node, the floriferous portion oblong, densely many-flowered, to 15 mm. long; peduncles slender, 5--13 mm. long, appressed-puberulent; bractlets ovate, about 2 mm. long and wide, acute at the apex, densely puber-

ulent and resinous-granular; corolla white, hypocrateriform, barely surpassing the bractlets, the limb about 2 mm. wide, densely puberulent on the outside.

The type of this species was collected by Henry Harold Welch Pearson (no. 2673) — in whose honor it was named — in open places between Chibia and Quihita, southern Angola, on May 13, 1909, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. The collector notes that the stems and leaves are fragrant, and that the plant is common. Gossweiler found it at 1000 meters altitude. Material has been misidentified and distributed in herbaria under the name L. asperifolia Marthe.

In all, 9 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: ANGOLA: Hufla: Antunes or Dekindt 710 (Ul), s.n. (Ul); C. Henriques 149 (Ul). Mossamedes: Gossweiler 13439 (Ul, Ul, Ul); E. J. Mendes 61 (Ul). Province undetermined: H. H. W. Pearson 2673 (F--photo of type, K--type, N--isotype, N--photo of type, Sg--photo of type, Z--photo of type).

LIPPIA PEARSONI var. SESSILIS Moldenke, var. nov.

Haec varietas a forma typica speciei foliis sessilibus reflexis recedit.

This variety differs from the typical form of the species in having its leaves sessile and reflexed.

The type of this variety was collected by Teixeira & Andrade (no. 6652) at Caputo, altitude 1700 meters, Huambo, Angola, on May 9, 1962, and is deposited in the herbarium of the Centro de Botânica, Junta de Investigações do Ultramar, Lisbon. The collectors note that "Planta de base anual, raiz rizomatosa. Caules quadrangulares, dum verde amarelado. Flores e estames cremas. Anteras roxas. Toda a planta revestida de um indumento" and record the common name "ondembe itito". It is known thus far only from the type specimen.

Citations: ANGOLA: Huambo: Teixeira & Andrade 6652 (Ul--type).

LIPPIA PEDUNCULATA H. H. W. Pearson, Trans. S. Afr. Phil. Soc. 15: 175--176. 1905.

Bibliography: H. H. W. Pearson, Trans. S. Afr. Phil. Soc. 15: 175--176. 1905; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Phytologia 5: 26. 1954; Moldenke, Résumé 154 & 462. 1959; Moldenke, Phytologia 12: 231 & 232. 1965.

A woody perennial; branches erect, subterete, striate, hispid-scabrid; leaves decussate-opposite, very short-petiolate; petioles about 2 mm. long; leaf-blades ovate or elliptic-ovate, 3--5 cm. long, 1--1.5 cm. wide, obtuse or subacute at the apex, narrowed at the base, crenate-serrate along the margins, rugose, roughly hispidulous above, hispid on the venation beneath, profusely glandular-dotted; spikes at first globose, later cylindrical, axillary, solitary or paired; peduncles long, slender, hispid; bractlets broadly oblong, 3--4.5 mm. long, 2--2.5 mm. wide, abruptly acuminate or caudate-

acuminate at the apex, truncate at the base, hispid on both surfaces and especially along the margins, not surpassing the flowers; calyx conspicuously 2-lobed, 1.5--2 mm. long, 4-veined, softly villous on the outer surface, the lobes almost as long as the tube, each 2-veined and more or less obscurely 2-dentate; corolla hypocrateriform, 4--5 mm. long, villous above the middle on the outside, puberulous in the throat.

The type of this species was collected by J. H. McLea (no. "34" or "321") somewhere in the Transvaal, South Africa, the precise locality not indicated on the label, and is deposited in the Bolus Herbarium. Pearson (1905) says: "L. pedunculata has affinities both with L. scaberrima and L. asperifolia, being apparently more closely allied with the former. The most marked characters which separate it from L. scaberrima are found in the 4-toothed calyx, the smaller bracts, the more pronounced hairiness, and the comparatively smoother surface of the whole plant. From L. asperifolia it differs in the 4-toothed calyx, the larger bracts and spikes, and the less hairy, rougher, and larger leaves."

The Repton 1722, distributed as L. pedunculata, is actually L. pretoriensis H. H. W. Pearson. I know nothing of L. pedunculata beyond what is given in the bibliography and have as yet seen no material of it.

LIPPZIA PEDUNCULOSA Hayek in Fedde, Repert. Nov. Sp. 2: 87. 1906.

Synonymy: Lippia pulchella Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96, nom. nud. 1942. Lippia pedunculosa Moldenke, Alph. List Invalid Names Suppl. 1: 15, sphalm. 1947.

Bibliography: Hayek in Fedde, Repert. Nov. Sp. 2: 87. 1906; Prain, Ind. Kew. Suppl. 4: 142. 1913; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Alph. List Cit. 1: 222. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 15. 1947; Moldenke, Phytologia 2: 385. 1947; Moldenke, Alph. List Cit. 3: 695 & 900 (1949) and 4: 1296. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Résumé 94, 316, & 462. 1959.

Bush, to 3 m. tall; branches and branchlets slender, buff-colored, acutely or obtusely tetragonal, nitidulous, minutely puberulent, becoming glabrous (except at the nodes), twiggy; leaves decussate-opposite, very numerous, mostly with fascicles of smaller ones in their axils; petioles slender, 1--7 mm. long, sparsely strigillose; leaf-blades subchartaceous, narrow-lanceolate, 0.4--4 cm. long, 2--9 mm. wide, acute at the apex, regularly dentate from near the base to the apex with small acute or blunt appressed or slightly divergent teeth, acute at the base, rather sparsely strigose with bulbous-based hairs above, short-pubescent or strigose-puberulent beneath and densely resinous-punctate, rough above (especially in age); inflorescence axillary, abundant, solitary, opposite, erect or ascending, surpassing the subtending leaves; peduncles very slender, 1.5--7 cm. long, sparsely and obscurely puberulent; heads incanous throughout, 4--8 mm. long, 4--5 mm. wide, uniform in width through-

out; corolla hypocrateriform, pink or pinkish-violet, sometimes white.

The type of this very distinctive species and also of L. pulchella was collected by George Gardner (no. 1386) on shelving gneiss rock along and about 80 miles up the Rio São Francisco, Alagoas, Brazil, in March, 1838; that of Hayek is deposited in the herbarium of the Naturhistorisches Museum at Vienna, where it was photographed by Macbride as his type photograph number 34326; that of L. pulchella is deposited in the herbarium of the Royal Botanic Gardens at Kew. Schery found the species growing in sub-xerophytic, rocky, sandy soil, flowering in January.

In all, 9 herbarium specimens, including type material of all the names involved, and 5 mounted photographs have been examined by me.

Citations: BRAZIL: Alagoas: G. Gardner 1386 [Macbride photos 34326] (Cb--isotype, Cb--isotype, It--isotype, It--photo of type, K--isotype, Kr--photo of type, M--isotype, N--isotype, N--photo of type, N--photo of isotype, S--isotype, Z--photo of isotype); Netto s.n. (Ja--46552). Bahia: Schery 504 (N).

LIPPIA PENDULA Rusby, Bull. N. Y. Bot. Gard. 8: 116. 1912.

Bibliography: H. H. Rusby, Bull. N. Y. Bot. Gard. 8: 116. 1912; Prain, Ind. Kew. Suppl. 5: 153. 1921; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 40, & 96. 1942; Moldenke, Lilloa 12: 148. 1946; Moldenke, Bol. Soc. Venez. Cienc. Nat. 11: 46. 1947; Moldenke, Alph. List Cit. 2: 486 & 626 (1948) and 3: 844. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, & 190. 1949; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 94, 114, & 462. 1959; Maria, Fl. Vall. Coch. 38. 1962; Moldenke, Résumé Suppl. 10: 3. 1964; Moldenke, Phytologia 12: 47, 170, & 203. 1965.

A slender bush or shrub, to 2.5 m. tall, velvety-hairy throughout; branches long, slender, strongly ascending, somewhat tetragonal; petioles stout, to 15 mm. long; leaf-blades thick-textured, dark-green above, gray beneath, oval or ovate, 1.5--6 cm. long (or longer), 0.8--3 cm. wide, subacute at the apex, rounded to subcordate at the base, finely crenate along the margins, the upper surface finely bullate, the slender yellow midrib and secondaries prominent beneath; inflorescence axillary; peduncles slender, about 8 mm. long, clustered, pilose, some pendulous; heads 5--6 mm. wide, some a little longer than wide; bractlets broadly ovate, closely imbricate, acute at the apex; flowers about 5 mm. long; calyx ovoid, half as long as the corolla-tube, pilose on the outside, the triangular teeth very small; corolla hypocrateriform, pilose, the tube slender, purple, abruptly swollen just above the middle, then again contracted, the limb yellow, abruptly expanded, about 2 mm. wide, the lobes rounded; stamens inserted in the swollen part of the corolla-tube.

This species is based on a specimen collected by Robert Statham Williams (no. 307) at Apolo, La Paz, Bolivia, at an altitude of 4800 feet, on February 27, 1902, and is deposited in the Britton

Herbarium at the New York Botanical Garden. Rusby (1912) says: "No. 96, from the same locality, Feb. 23, is the same, as is No. 162, from the same locality, collected April 16, the leaves larger than those of the others. Species very near L. origanoides H.B.K."

The species has been found growing on campos at altitudes of 720 to 1600 meters, flowering in February and April. In the Instituto Miguel Lillo the original publication is cited as "Rusby, Bolivia (1912) 116". Maria (1962) cites his no. 117/3c from Cochabamba, Bolivia. The Kuntze s.n. [Sta. Cruz, 1000 m., V.92], distributed as L. pendula, is actually L. affinis Schau., while Julio II.138 is L. suffruticosa (Griseb.) Kuntze.

In all, 8 herbarium specimens have been examined by me, including the type.

Citations: BRAZIL: Minas Gerais: Regnell 38 (Ja—32322). Paraná: Dusén 14929 (W—1481644), 16591 (W—1481645). BOLIVIA: La Paz: R. S. Williams 96 (N, W—1159330), 162 (N), 307 (N—type, 2—isotype).

LIPPIA PHAEOCEPHALA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158—1159. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158—1159. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 494. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Lilloa 8: 425 (1942) and 10: 379. 1944; Moldenke, Alph. List Cit. 1: 264 (1946) and 3: 693. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 190. 1949; Moldenke, Phytologia 3: 289. 1950; Moldenke, Résumé 117, 119, & 462. 1959; Troncoso, Darwiniana 12: 258, 259, & 275—277, fig. 10. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24 & 90. 1965.

Illustrations: Troncoso, Darwiniana 12: 277, fig. 10. 1961.

A dioecious medium-sized subshrub, to 0.6 m. tall; stems erect, thickened at the base, branched, glabrescent in age; branches ascending, greenish, tetragonal, sparsely strigose with antrorse hairs and also spreading glandular-pilose; middle internodes 4—10 cm. long; leaves decussate-opposite, subsessile; petioles slender, 3—8 mm. long, strigose and spreading glandular-pilose like the branches; uppermost leaf-blades narrowly lanceolate and subentire, the rest lanceolate or oblong-lanceolate, to 7 cm. long and 1.7 cm. wide, narrowly short-acuminate or almost apiculate at the apex, lightly long-convex along the margins, extenuated at the base, green on both surfaces, somewhat rigid, roughened on both surfaces with a few antrorse strigose hairs, rather conspicuously few-dentate toward the apex, the teeth 0.1—0.8 mm. long and 5—8 mm. apart, the venation rather regularly pinnate, hardly at all or but slightly impressed above, conspicuous but hardly prominent beneath; inflorescence axillary; peduncles slender, elongate, 3—5 cm. long, shorter than or subequaling the subtending leaves, glandular-pilose, with only a few or very few strigose hairs; heads cinereous, subcylindric-globose, about the size of a drupe of Prunus

spinosa L., 8--10 mm. long and 7--8 mm. wide during anthesis; bractlets broadly ovate, about 4 mm. long and 3 mm. wide, acuminate at the apex, densely imbricate, antrorsely strigose on the outer surface with long and numerous hairs, about equaling or slightly surpassing the flowers, the lower ones larger, all accrescent after anthesis; calyx very minute during anthesis, campanulate, less than 0.5 mm. long, obscurely 2-lipped, the lips subentire; corolla hypocrateriform, lemon-yellow or orange, minute, puberulent above on the outside, the tube cylindrical, exerted, the limb 4-lobed, the lobes small, ovate, the anterior one larger; stamens and pistil included, normal for the genus; fruiting-heads 10--12 mm. long and 10 mm. wide; mericarps about 1.5 mm. long and 1 mm. wide, smooth, the inner face excavated, accompanied by the noticeably pubescent calyx-segments when shed.

This species was based by Briquet on two collections made by Emil Hassler in Paraguay -- one (no. 6798a) collected on a campo near Chololo, in the valley of the Río Y-acá, in December, and the other (no. 7456) collected on a campo near Concepcion, in September, both deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where the latter was photographed by Macbride as his type photograph number 24659. Troncoso (1961) excludes no. 7456, which she says is L. asperri-
ma Cham., and regards no. 6798a as lectotype of L. phaeocephala, citing the Geneva specimen not as yet seen by me.

Briquet (1904) says: "Cette jolie espèce est voisine du L. turnerifolia; elle s'en distingue par les glandes stipitées assez abondantes mêlées aux poils strigieux plus rares et l'absence d'indument hirsute, par la forme plus cylindrique de ses capitules à bractées plus amplement ovées sous l'acumen, la forme et le mode de serrature des feuilles etc. Le sommet de l'axe, dépassé par les derniers pédoncules axillaires, est rendu complètement blanc par les poils strigieux très serrés qui le recouvrent. Le L. Morongii O. K. (L. angustifolia Morong non Cham.) s'en distingue facilement par l'absence d'indument glanduleux, les feuilles caulinares plus longuement acuminées au sommet et les capitules dépourvues de l'indument cendré-gris caractéristique pour le L. phaeocephala. D'ailleurs, dans le L. phaeocephala les pédoncules atteignent souvent la longueur des feuilles, tandis qu'ils sont notablement plus courts dans le L. Morongii, ce qui entraîne un port assez différent."

In all, 6 herbarium specimens, including material of the lectotype, and 4 mounted photographs have been examined by me.

Citations: PARAGUAY: Hassler 7456 [Macbride photos 24659] (It--photo of lectotype, Kr--photo of lectotype, N--lectotype, N--photo of lectotype, W--photo of lectotype). URUGUAY: Arechavaleta 14 (Ug); Legrand 2570 (Ug), 3489 (N, Ug), 3490 (Ug).

LIPPIA PHRYXOCALYX Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161--1162. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161--1162. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 497. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Lilloa 8: 425 (1942) and 10: 379. 1944; Moldenke, Alph. List Cit. 1: 264. 1946; Moldenke, Phytologia 2: 385 & 386. 1947; Moldenke, Lilloa 14: 44. 1948; Moldenke, Alph. List Cit. 2: 553 (1948), 3: 689 (1949), and 4: 1165. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 99, & 190. 1949; F. C. Hoehne, Ind. Bibl. & Num. Pl. Col. Com. Rondon 349. 1951; Moldenke, Résumé 94, 117, & 462. 1959; Troncoso, Darwiniana 12: 258, 291, & 292, fig. 18. 1961; Moldenke, Phytologia 12: 24, 242, & 252. 1965.

Illustrations: Troncoso, Darwiniana 12: 292, fig. 18. 1961.

Shrub, to 2 m. tall; bark on the older branches brown, on the younger ones green, sometimes becoming purplish; branches obtusely tetragonal or hexagonal, shortly glandular-pilose throughout; middle internodes 3--4 cm. long; leaves decussate-opposite or ternate, very shortly subpetiolate; petioles only 2--3 mm. long; leaf-blades rather rigid, dark-green above, pale-green beneath, ovate-elliptic, 3--4 cm. long, 2--2.5 cm. wide, acute or shortly subacuminate at the apex, often more convex along the margins below the middle, regularly crenate-dentate along the margins, rounded-extenuate at the base, scabrid and also glandular-punctate above, very shortly glandular-pilose beneath, the teeth numerous, often mucronate, 0.5--1 mm. long, 2--3 mm. apart, the venation reticulate, more or less impressed above, prominulous beneath; inflorescence axillary or often supra-axillary, spicate, pedunculate; peduncles 1.5--2.5 cm. long, shorter than the subtending leaves, densely glandular-pilose; spikes short, lax, alternate-flowered, at first hemispheric and head-like, 1 cm. long and 1--1.3 cm. wide, later elongate and spike-like, to 2.5 cm. long, the rachis densely glandular-pilose; flowers finally rather lax, short-pedicellate; bractlets rather large, oblong-elliptic or oblong to lanceolate, membranous, loose, to 8 mm. long and 2 mm. wide, somewhat venose, colored, often becoming purple, acute or short-acuminate at the apex, plicate, shortly glandular-pilose on the outer surface; calyx short-pedicellate, ovate-campanulate, to 2 mm. long in anthesis, somewhat 2-lipped or bilabiate-bifid, the lips subentire or 4-dentate, hirtous or long-hirsute on the outer surface with spreading white hairs and also glandular-punctate; corolla hypocrateriform, surpassing the subtending bractlets, rose or clear-rose to light reddish-violet or light-violet, surpassing the calyx-mouth by 8 mm., puberulent above, to 11 mm. long, the tube exerted, 7--8 mm. long, slender at the base, gradually somewhat ampliate upwards, the throat the same color as the limb or white, the limb spreading, to 12 mm. wide, the upper lobes connate for a long distance, the lateral ones rounded, the anterior one larger and obcordate, the upper and lateral ones to 1 mm. long, the anterior one about 1.5 mm. long and 1.9 mm. wide; stamens and pistil included, normal for the genus; mericarps oblong, about 2.3 mm. long and 1 mm. wide, smooth, accompanied by the densely long-hirsute calyx-segments when shed; rachis after the shedding of the

fruit to 4.5 cm. long, roughened by the persistent elongate pedicels.

The type of this very distinctive species was collected by Emil Hassler (no. 7896) in November in thickets in the region of the upper Río Apa, Paraguay, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva; an isotype deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed, was photographed by Macbride as his type photograph number 17531.

The species has been found growing in the shade of thickets, on high plateaus, on mountains, and on mountainsides in the true caatinga formation, flowering in May, July, November, and December. Material has been misidentified and distributed in herbaria as L. lasiocalycina Cham. and as Verbena sp.

Briquet (1904) says: "Espèce de premier ordre, sans affinité avec aucune de celles de la section Euzapania. La forme des feuilles, la glandulosité, les capitules s'allongeant pendant l'antèse, et l'indument remarquable du calice rapellent de L. lasiocalycina Cham. placé par Schauer parmi les Euzapania. Mais le L. phryxocalyx ne montre pas l'état aphyllé à inflorescence densément racemiforme décrit par Chamisso et figuré par Schauer (in Mart. Fl. brasil., vol. IX, tab. 39); sa biologie végétative est tout autre. En outre, le L. phryxocalyx s'écarte du type boliviano-brésilien par ses feuilles crénelées-dentées, fermes, à créneaux nombreux et serrés et par l'absence de coussinets d'insertion volumineux, mamelonnés et laineux pour les pédoncules."

Troncoso (1961) says: "Especie muy característica, sin estrecha afinidad con ninguna otra de la sección Lippia. Para ubicarla dentro del sistema he debido fundar una nueva sección: Pseudoaloy-sia, cuyes caracteres principales se detallan al principio de esta nota....Frutices, spicis brevibus laxis, pedunculatis, axillaribus, insertione saepe a petiolo distanti (supra-axillari), bracteis lanceolatis, pro rata magnis, coloratis, floribus breviter pedicellatis, calyce hirto, bilabiato-bifido, 4-dentato."

It is very possible that L. lasiocalycina var. sainthilairi Moldenke belongs here.

In all, 15 herbarium specimens, including type material, and 7 mounted photographs have been examined by me.

Citations: BRAZIL: Maranhão: Eiten & Eiten 4037 (W--2445210), 4506 (W--2445198). Matto Grosso: F. C. Hoehne Com. Rondon 2839 (N). Piauí: Eiten & Eiten 4914 (N). PARAGUAY: Anisits 2736 (S), 2742 (S); Fiebrig 4956 (Bm); Hassler 7896 [Macbride photos 17531] (Ca--944347--isotype, It--photo of isotype, Kr--photo of isotype, N--isotype, N--isotype, N--photo of isotype, S--isotype, W--photo of isotype), 10630 (A); T. Rojas s.n. [Hassler 10630; "630"] (N, N, S).

LIPPIA PICKELII Moldenke, Lilloa 5: 424--425. 1940.

Bibliography: Moldenke, Lilloa 5: 424--425. 1940; Moldenke,

Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Cit. 1: 264. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 76. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 190. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Moldenke, Résumé 117 & 462. 1959.

Perennial herb, woody at the base; stems and branches very slender, rather densely hispidulous with whitish erect hairs on the younger parts, more sparsely so in age; leaves decussate-opposite; petioles slender, hispidulous with erect white hairs 1--2 mm. long; leaf-blades chartaceous, elliptic or ovate, 2.5--6.5 cm. long, 1--3 cm. wide, acute or obtuse (in outline) at the apex, acute or acuminate at the base, regularly serrate from near the base to the apex with very small blunt antrorse teeth, strigose or hispidulous on the lamina (not the venation) above with whitish bulbous-based hairs, strigose on the venation with non-bulbous hairs beneath; inflorescence axillary, much shorter than the subtending leaves, ascending, solitary, opposite, 8--13 mm. long; peduncles very slender, 3--5 mm. long, hispidulous.

The type of this species was collected by Emil Hassler (no. 11040) in limestone areas along the upper course of the Río Apa, Paraguay, in March, 1913, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. It is named in honor of my good friend and colleague, Don Bento Pickel, of the Department of Forestry in São Paulo, who has contributed so much to our knowledge of the flora of Pernambuco and São Paulo. The species is known thus far only from the type collection. In all, 5 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: PARAGUAY: Hassler 11040 (Cb--type, K--isotype, N--isotype, N--photo of type, N--photo of isotype, S--isotype, V--isotype, Z--photo of type, Z--photo of isotype).

LIPPIA PLICATA J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 281. 1900.

Synonymy: Lippia adoënsis var. multicaulis Hiern, Cat. Afr. Pl. Welw. 1 (4): 829--830. 1900. Lippia strobiliformis Moldenke, Phytologia 2: 317. 1947.

Bibliography: J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 281. 1900; Hiern, Cat. Afr. Pl. Welw. 1 (4): 829--830. 1900; K. Schum. in Just, Bot. Jahresber. 28 (1): 496. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; R. Good, Journ. Bot. 68, Suppl. 2: 139--140. 1930; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50, 51, 95, & 96. 1942; Moldenke, Phytologia 2: 317 & 341. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115, 117, 119, & 189--191. 1949; Moldenke, Alph. List Cit. 3: 978 (1949) and 4: 1201, 1202, & 1220. 1949; Moldenke, Phytologia 3: 137 (1949), 3: 292 & 293 (1950), 3: 456 (1951), and 4: 190. 1953; E. J. Salisb., Ind. Kew. Suppl. 11: 138. 1953; Brenan, Mem. N. Y. Bot. Gard. 9: 36. 1954; Moldenke, Résumé 142, 145, 147--149, 310, 462, & 463. 1959; Moldenke, Phytologia 12: 42, 106, 231, 264, & 307. 1965.

Slender sparsely branched shrub, 0.5--2.3 m. tall, or herba-

ceous, with a mint odor; stems slender, tetragonal, ridged and sulcate, strigillose; branches few, woody, short, densely pubescent; nodes not annulate; principal internodes 3.5--6 cm. long; leaves decussate-opposite, short-petiolate, very fragrant; petioles slender, 2--5 mm. long, strigose; leaf-blades firmly chartaceous, green or grayish-green on both surfaces, ovate or lanceolate to elliptic, 3--6 cm. long, 1--2 cm. wide, often plicate, acute at the apex, regularly serrulate or crenate along the margins, acute at the base, scabrous or very scabrous and slightly subbullate above, puberulent or densely pubescent and resinous-granular beneath; midrib slender, subprominulous above, prominulous beneath; secondaries slender, 6--8 per side, ascending, only slightly arcuate, subimpressed above, prominulous beneath; vein and veinlet reticulation subimpressed above, subprominulous beneath; inflorescence axillary or forming a terminal panicle, spicate-strobiliform, 2 per node, abundant; peduncles slender, firm, ascending, 1--3.8 cm. long, tetragonal, strigillose; spikes very densely capitate, oblong, 2--3.8 cm. long, about 1.5 cm. wide; bractlets large and conspicuous, very numerous, green, very closely imbricate and appressed antrorsely, ovate, 4--7 mm. long, 4--5 mm. wide, acute or abruptly acute to subacuminate at the apex, very densely appressed-pubescent with antrorse hairs which project prominently beyond the margins and form what appears macroscopically like a light border to the bractlets; flowers very fragrant, showy; corolla hypocrateriform, white or cream-color, with a yellow throat, its tube cylindrical, 4--8 mm. long, densely puberulent on the outside, the limb about 4 mm. wide, its lobes small and orbicular.

This handsome species was based on two collections made by Carson (nos. 81 & 128) at Fwambo, Urungu, Northern Rhodesia. The type of L. strobiliformis was collected by Captain Storms (no. 3) at Karema, Tanganyika, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. L. adoensis var. multicaulis is based on three collections made by Friedrich Martin Josef Welwitsch (nos. 5667, in part, 5690, in part, & 5733 in Angola.

The long slender roots of this plant are remarkable because of the large number of sessile nodules of presumably nitrogen-fixing bacteria which they bear, the nodules being 2--4 mm. in diameter. The flowers are described as "white" on A. Lea L.R. 50, Mullenders 2373, Quarré 2960, and Teixeira & al. 5341, as "cream" on Teixeira & Andrade 6654, and as "white, throat yellow" on Brass 16927. The plant has been found growing in herbaceous or shrubby savannas, in sandy soil, in old cultivations, and on the foothills of mountain ranges, at altitudes of 520 to 1700 meters, flowering in February, March, and June to August, fruiting in November. Brass found it "frequent in Brachystegia woodland", Teixeira describes it as "frequent and abundant in cultivated and abandoned soil", while Teixeira & Andrade say of it "planta de base vivaz de 50 cms. a 1,5 m. de altura; multicaule,

de um verde claro e de folhas rugosas; flores cremes; toda a planta de um cheiro muito agradável; pouca frequente nos terranos da Chianga". Vernacular names recorded for it are "mangue", "ondenbe", and "tschikoitsch".

Material has been misidentified and distributed in herbaria under the names Lantana salviaefolia Jacq. and L. salviifolia Jacq. On the other hand, the A. Peter 17145, distributed as Lippia plicata, is actually L. schliebeni Moldenke.

Baker (1900) separates the 8 tropical African species of Lippia known to him as follows:

1. Bractlets orbicular, obtuse at the apex.
 2. Peduncles very short.....L. oatesii.
 - 2a. Peduncles long.....L. radula.
- 1a. Bractlets cuspidate at the apex.
 3. Leaves small.
 4. Leaves orbicular to obovate.....L. somalensis.
 - 4a. Leaves oblong, rugose.....L. javanica.
 - 3a. Leaves larger, oblong or oblanceolate-oblong, scarcely rugose.....L. abyssinica.
- 1b. Bractlets acuminate at the apex.
 5. Leaves decussate-opposite.....L. ukambensis.
 - 5a. Leaves ternate.....L. burtonii.
- 1c. Bractlets acute at the apex.....L. plicata.

In all, 33 herbarium specimens, including type material of most of the names involved, and 13 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Callens 1280 (N); Charyois s.n. [1899] (Br); Claessens 574 (Br, N); Descamps s.n. [Juin 1895] (Br); Hecy s.n. [Albertville, Juin 1899] (Br); Herb. Com. Spec. Katanga 78 (Br); Kevers 12 (Br); Mullenders 2373 (Br); Quarré 2960 (Br, N). TANGANYIKA: E. M. Bruce 34 (F--photo, K, N, N--photo, Sg--photo, Z--photo); A. Lea L.R.50 (Af, Rh); Nutt s.n. (K); A. Peter 31959 [V.63] (B); Pielou 100 (S); Storms 3 (Br, Br, Br, F--photo, K--photo, N--photo, Si--photo, Z--photo). ANGOLA: Huambo: B. Teixeira 5341 (Ul); Teixeira & al. 5341 (Ul); Teixeira & Andrade 6654 (Ul). Province undetermined: Welwitsch 5667, in part (F--photo, K, N--photo, Sg--photo, Z--photo). MALAWI: Brass 16927 (N, W--2061898), 17370 (N, W--2062079); Smuts 2295 (Af); Stolz 686 (B, Mv); Whyte s.n. (W--550846).

LIPPIDIA PLICATA var. ACUMINATA (Moldenke) Moldenke, comb. nov.

Synonymy: Lippia strobiliformis var. acuminata Moldenke, Phytologia 2: 317--318. 1947.

Bibliography: Moldenke, Phytologia 2: 317--318 & 341. 1947; Moldenke, Alph. List Cit. 4: 1068, 1083, & 1084. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115, 119, & 191. 1949; Moldenke, Résumé 142, 147, & 463. 1959.

This variety differs from the typical form of the species in having often ternate leaves and inflorescences and in having the bractlets of its dense capitate spikes wide-spreading, not appressed, lanceolate-ovate, about 1 cm. long, 4--4.5 mm. wide, long-acuminate at the apex, densely puberulent, without a light border. The mature spikes are 2 cm. wide and the peduncles are to 4.5 cm. long.

The type of the variety was collected by Père Hyacinthe Vanderyst (no. 17168) in the region of Panzi, Republic of Congo, in 1925, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

In all, 10 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Vanderyst 16988 (Br), 17168 (Br--type, F--photo of type, N--photo of type, Si--photo of type, Z--photo of type), 22829 (Br), 22935 (Br), 22977 (Br, N), 23001 (Br), 23376 (Br), s.n. [Panzi, 1925] (Br). ANGOLA: Cuanza-sul: Gossweiler 9364 (W--1550202).

LIPPIA PLICATA var. PARVIFOLIA (Moldenke) Moldenke, comb. nov.

Synonymy: Lippia strobiliformis var. parvifolia Moldenke, Phytologia 2: 318. 1947.

Bibliography: Moldenke, Phytologia 2: 318. 1947; Moldenke, Alph. List Cit. 4: 1083. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 191. 1949; Moldenke, Résumé 142 & 463. 1959.

This variety differs from the typical form of the species in its smaller leaves, the petioles being 1 mm. long or obsolete, the leaf-blades elliptic, 1.5--3 cm. long, 6--14 mm. wide; inflorescences 2--4 per node, 1--5 cm. long; and the bractlets spreading or reflexed, closely imbricate but not appressed, ovate, 7--8 mm. long, 3--4 mm. wide, short-acuminate at the apex, densely appressed-puberulent, sometimes subrevolute along the margins, without a lighter border or with an obscure one.

The type of the variety was collected by Père Hyacinthe Vanderyst (no. 23423) at Mérode, Republic of Congo, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels. Collectors describe the plant as 1--1.5 m. tall, with white flowers, blooming in March, April, and June. Common names recorded for it are "kiwenie" and "monunka". Quarré says: "dressée de 2/3, 30 de haut formant buisson répandu par station de 15 à 30 pieds; tige verte a côte. Fls. opposées vertes jaunes, elliptiques dentelées. Flrs. en plateau au sommet; a forte odeur de menthe." The Brédo 5112, cited below, was originally distributed as "51012", but Dr. Robyns writes me that this was an error in transcription.

In all, 20 herbarium specimens, including the type, and 4 mounted photographs have been examined by me.

Citations: CONGO LEOPOLDVILLE: Brédo 5112 (Br); De Witte 287 (Br, Br, N), 453 (Br, Br); Luxen 107 (Br, Br, N); Quarré 2960 (Br,

Br, Br, N); Robyns 1977 (Br, Br); Vanderyst 22830 (Br), 22889 (Br, N), 23423 (Br--type, F--photo of type, N--photo of type, Si--photo of type, Z--photo of type), 23427 (Br).

LIPPIA POHLIANA Schau. in A. DC., Prodr. 11: 577. 1847.

Synonymy: Lippia nepetacea Schau. in A. DC., Prodr. 11: 577--578. 1847.

Bibliography: Schau. in A. DC., Prodr. 11: 577--578. 1847; Schau. in Mart., Fl. Bras. 9: 228--229. 1851; Bocq., Adansonia 3: 244. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 541. 1911; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Alph. List Invalid Names 31. 1942; Moldenke, Alph. List Cit. 1: 238. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 76. 1948; Moldenke, Alph. List Cit. 3: 686, 689, 751, & 824 (1949) and 4: 1086. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 80, 81, & 190. 1949; Moldenke, Résumé 94, 315, & 462. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Phytologia 12: 23, 275, & 289. 1965.

Much-branched shrub, to 1.5 m. tall; stems usually terminating in the almost leafless subpaniculate inflorescence-branches; branches elongate, tetragonal, verticillate, subhirsute; branchlets elongate, spreading or wide-spreading, subfastigate, subtetragonal or tetragonal, tomentellous or subhirsute; leaves decussate-opposite or ternate, short-petiolate, spreading or reflexed, those of the branches larger, of the branchlets smaller, decreasing in size upwards, shorter than the internodes; petioles very short, often semi-amplexicaul; leaf-blades broadly rounded or subrotund to orbicular, mucronate at the apex, rounded or cordate at the base, crenate along the margins, penninerved, rugose or very rugose, villous-tomentose on both surfaces or holosericeous-tomentose above, canescent and glandulose beneath, pubescent-tomentose throughout or only on the vein reticulation beneath, more rugose and more densely tomentose on the leaves of the branches, those beneath the flowers about 2.5 cm. long, 1.6--1.8 cm. wide, the tomentum short and handsome, sometimes more dense, sometimes sparse and especially meager in the veinlet interstices on the lower surface, the 5 or 6 secondaries on each side of the midrib, as well as the veinlets, often rubescent; peduncles axillary, 2--6 per axil, weak, shorter than or subequaling the subtending leaves, about 4 mm. long, mostly reflexed and drooping, villous; heads tetraquetrous-ovoid, stramineous, 4--6 mm. long, more or less sericeous; bractlets membranous, pale, broadly ovate or subrotund-ovate, imbricate, acuminate at the apex with a spreading or recurved and complicate acumen, glandulose, shorter than the corollatube, the margins and keel villous or sericeous-villous; calyx short, villous, bifid; corolla hypocrateriform, white or yellow, becoming pink in age, the limb small, crisped, the upper and lateral lobes exiguous, the lower erect and quadrangular-subrotund, or the upper lobe ovate, the lower quadrate and erect, and the lateral ones small, ovate, and obtuse.

This species was based by Schauer on several collections made in Goiás, Brazil, by Johann Emanuel Pohl — in whose honor it was named — at Caldas Novas, Parapitinga, and Menaponte (no. 2791) — and on one made by Ludwig Riedel somewhere in Brazil, probably in São Paulo ["loco natali non indicata"], deposited in the De Candolle, Leningrad, and Vienna herbaria. A specimen of J. E. Pohl 141, regarded by me as another cotype, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed by Macbride as his type photograph number 17532, but is now destroyed. Lippia nepetacea was based by Schauer on collections made by Pohl at Engenho do São João das Antas and at Izidro, Conceicao, also in Goiás, Brazil, and on one by Vauthier (no. 410) on desert campos of Serra do Frio in Minas Gerais. The latter was photographed by Macbride in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva as his type photograph number 7860. Both species were placed by Schauer in his Section Goniostachyum.

The species has been found growing on campos and desert campos, flowering from April to June. Mosén 4318 is very immature. Material has been misidentified and distributed in herbaria under the names L. martiana Schau., L. microphylla Cham., and L. myriantha Mart. Glaziou (1911) cites his no. 21914 under L. sericea Cham.

In all, 13 herbarium specimens and 18 mounted photographs, including type of phototype material of both names involved, have been examined by me.

Citations: BRAZIL: Goiás: J. E. Pohl 141 [Macbride photos 17532] (It—photo of cotype, Kr—photo of cotype, N—photo of cotype, N—photo of cotype, W—photo of cotype), 2791 [Menaponte, 1818] (Br—cotype, F—photo of cotype, N—photo of cotype, Si—photo of cotype, Z—photo of cotype), s.n. [Brasiliae] (Br—cotype, Br—cotype, F—photo of cotype, N—photo of cotype, Si—photo of cotype, Z—photo of cotype). Minas Gerais: Brade 13907 [Herb. Rio de Jan. 29535] (N); Glaziou 19708 (Br, Bz—21777, N), 21914, in part (Br); Mendes Magalhães 1770 [Herb. Jard. Bot. Belo Horiz. 41580] (Be—14562, N, N); Mosén 4318 (N, S); Vauthier 410 [Macbride photos 7860] (It—photo, Kr—photo, N—photo, Ug—photo, W—photo).

LIPPIA POLYTRICHA Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158. 1904.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 494. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Lilloa 8: 425 (1942) and 10: 379. 1944; Moldenke, Alph. List Cit. 1: 263 (1946) and 3: 693. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 190. 1949; Moldenke, Résumé 117 & 462. 1959; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Troncoso, Darwiniana 12: 258 & 278—280, fig. 11. 1961; Moldenke, Phytologia 12:

24. 1965.

Illustrations: Troncoso, Darwiniana 12: 279, fig. 11. 1961.

Dioecious medium-sized subshrub, to 0.5 m. tall; stems incrassate, indurate, erect or ascending, coarsely spreading-hirsute throughout with white bulbous-based hairs; internodes often short or slightly elongate, the middle ones often 2--5 cm. long; leaves decussate-opposite, sessile; lowest leaf-blades broadly ovate or subrotund, the rest ovate or ovate-lanceolate, 3.5 cm. long, 1--2.5 cm. wide, obtuse or acute to shortly subacuminate at the apex, often more convex along the margins below the middle, rounded-extenuate at the base, green on both surfaces and coarsely spreading-hirsute with white bulbous-based hairs (the base conic-incrassate), rather rigid, rugose or almost bullate above, rather coarsely crenate-serrate along the margins, the teeth to 1.5 mm. long, 2--6 mm. apart, the venation simply pinnate, slightly reticulate, the lateral veins 4 or 5, medium prominent; peduncles axillary, shorter than the leaves, 1--2 cm. long, densely spreading-hirsute throughout; heads broadly hemispheric, about 0.5 cm. long and 1 cm. wide; bractlets broadly ovate, surrounding the base of the head, about 5 mm. long and 3 mm. wide, subacuminate at the apex, long-hirsute on the outer surface, subequaling the flowers, the inner ones greatly reduced, narrower, shorter than the flowers; calyx very minute, scarcely over 0.5 mm. long, obscurely subbilabiate, with a few hairs on the outside; corolla hypocrateriform, yellow, surpassing the calyx-mouth by 3--4 mm., the tube exerted, ampliate above, the lobes ovate-rounded, puberulent on the outside, less than 1 mm. long, the anterior one larger; stamens and pistil included, normal for the genus; mature mericarps not seen.

This species was based by Briquet on two collections made by Emil Hassler in Paraguay -- one, made in August (no. 4184) in fields near San Estanislao, and the other (no. 4636) made on a campo near the Río Jejuiguazu in September, both deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where the former was photographed by Macbride as his type photograph number 24660.

Briquet (1904) says: "Cette élégant espèce est encore voisine du L. turnerifolia dont elle diffère par l'abondante villosité lâche qui recouvre tout la plante, ses feuilles plus amples arrondies-sessiles à la base, les bractées beaucoup plus largement ovées, etc." Troncoso (1961) regards no. 4184 as lectotype and no. 4636 as syntype.

Thus far the species is known only from the type collections, of one of which I have examined 3 mounted photographs.

Citations: PARAGUAY: Hassler 4184 [Macbride photos 24660] (It--photo of cotype, Kr--photo of cotype, N--photo of cotype).

LIPPIA PRAECOX Mildbr. ex Moldenke, Phytologia 4: 190 & 292. 1953.

Bibliography: Moldenke, Phytologia 4: 190 & 282. 1953; Moldenke, Biol. Abstr. 27: 3121. 1953; G. Taylor, Ind. Kew. Suppl. 12: 82. 1959; Moldenke, Résumé 149 & 462. 1959.

Perennial herb, growing from a large woody underground stem often 1.5--2.5 cm. thick and 4 cm. long, apparently burned off periodically; above-ground stems several or numerous, apparently slender and short, 1--4 cm. long, simple, densely white-hirsute; principal internodes 5--10 mm. long; leaves decussate-opposite, subsessile or with carinate-winged very short petioles; leaf-blades oblong-ovate, 5--7 mm. long, 4--5 mm. wide, densely white-hirsutulous on both surfaces, obtuse or rounded at the apex, narrowed into the petiole at the base, often obscurely 3-denticulate near the apex; inflorescence axillary, capitate, decussate-opposite; peduncles filiform, 1--1.5 cm. long, densely white-hirsutulous; heads many-flowered, hemispheric; bractlets broadly ovate, about 3 mm. long and wide, acuminate at the apex, rounded or subtruncate at the base, densely whitish-hirsutulous or short-pubescent on the back, ciliate-margined; corolla hypocrateriform, 3.5--4 mm. long, the tube very narrow, the limb about 1.5 mm. wide.

The type of this curious species was collected by Adolf Ferdinand Stolz (no. 2210) at Kyimbila, at 1350 meters altitude, Malawi, in 1912, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The species is known thus far only from the original collection. In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: MALAWI: Stolz 2210 (Af--isotype, B--isotype, N--isotype, N--photo of type, S--type, Z--photo of type).

LIPPIA PRETORIENSIS H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 197. 1901.

Synonymy: Lantana pretoriensis H. H. W. Pearson ex Moldenke, Alph. List Invalid Names 28, in syn. 1942. Lippia crenata Pearson ex Moldenke, Résumé 311, in syn. 1959 [not L. crenata (Griseb.) Kuntze, 1898, nor Kuntze, 1904, nor Sessé & Moc., 1894].

Bibliography: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5 (1): 197. 1901; A. W. Hill, Ind. Kew. Suppl. 6: 117. 1926; Moldenke, Alph. List Invalid Names 28. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 96 (1942) and [ed. 2], 122 & 190. 1949; Moldenke, Résumé 154, 306, 311, & 462. 1959; Moldenke, Phytologia 12: 56, 231, 235, & 236. 1965.

Erect shrub, to over 0.5 m. tall; adult stems tetragonal, striate, scabrid-pubescent, with rounded glabrescent angles; principal internodes about 6.3 cm. long; leaves decussate-opposite, aromatic, short-petiolate; leaf-blades elliptic-oblong, 5--6.3 cm. long, about 2 cm. wide, more or less narrowed at both ends, obtuse at the apex, with crenate thickened and recurved margins, scabrid-puberulous above, scabrid-pubescent on the venation beneath, glandular-punctate; secondaries 4--6 on each side, ascending, impressed above, prominent beneath; peduncles slender, terete, 4--4.5 cm. long, pubescent; spikes small, solitary, globose, 4--5 mm. wide, with a glabrous axis; bractlets broadly ovate, acuminate at the apex, truncate or subcordate at the base, 3--7-veined at the base, with a

prominent midrib, pubescent, the outer ones 5--6 mm. long and 3 mm. wide, the inner ones 3--4 mm. long and 1.5--2 mm. wide; calyx 1--1.5 mm. long, glabrous within, pubescent outside and on the rim, very shortly 2-lobed, the lobes rounded; corolla hypocrateriform, white, 2--4 mm. long, densely pubescent on the outside above the middle, glabrous within.

The type of this not very well marked species was collected by A. Rehmann (no. 4523) at Woderboom Port near Pretoria, Transvaal, in the Republic of South Africa; L. crenata is based on the same type and apparently represents Pearson's first choice as a name for the taxon until he discovered that it was invalidated by the existence of an earlier homonym.

The species has been found at altitudes of 2000 feet, flowering in February. Material has been misidentified and distributed in herbaria under the names L. pedunculata H. H. W. Pearson and Lantana salviaefolia Jacq. It should be noted here that the names Lippia crenata Kuntze and L. crenata (Griseb.) Kuntze are synonyms of L. junelliana (Moldenke) Troncoso, while L. crenata Sessé & Moc. is a synonym of L. alba (Mill.) N. E. Br.

Pearson (1901) distinguishes this taxon from some related South African species more or less as follows:

1. Calyx distinctly 2-lobed.
 2. Bractlets more than 4 mm. long and 3 mm. wide, surpassing the flowers.....L. scaberrima.
 - 2a. Bractlets less than 4 mm. long and 3 mm. wide, not surpassing the flowers.....L. javanica.
- 1a. Calyx truncate, subtruncate, or obscurely lobed.
 3. Leaf-blades serrate or crenate-serrate.
 4. Bractlets more than 4 mm. long; calyx truncate or obscurely 4-toothed.....L. wilmsii.
 - 4a. Bractlets less than 4 mm. long; calyx obscurely 2-lobed.....L. rehmannii.
 - 3a. Leaf-blades crenate.....L. pretoriensis.

Dr. Meeuse, however, in a letter to me dated September 28, 1953, comments that "I am inclined to believe that Pearson's L. rehmannii, L. wilmsii, L. bazeiana and L. pretoriensis can hardly be different from 'L. asperifolia' (= L. javanica)." In a letter dated December 9, 1953, he says "The Lippia material is extremely variable and some of Pearson's species definitely must be sunk. His calyx-character (distinctly lobed or indistinctly lobed to truncate) is useless, to my mind, so that L. wilmsii cannot on very good grounds be separated from L. scaberrima, and the three L. rehmannii-bazeiana-pretoriensis are also very close. As will be evident from many annotated specimens, several other botanists have ground their teeth on our Lippias without finding any clear-cut characters."

In all, 5 herbarium specimens and one mounted photograph of the type have been examined by me.

Citations: REPUBLIC OF SOUTH AFRICA: Transvaal: Codd & Winter 4904 (Af); Junod 40 (Af); Leendertz 12366 (Af); Rehmann 4523 (N—photo of type); Repton 1722 (Af, Z).

LIPPIA PRIMULINA S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 435--437. 1895.

Bibliography: S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 435--437. 1895; Briq., Arkiv Bot. Stockh. 2 (10): 21. 1904; Durand & Jacks., Ind. Kew. Suppl. 1: 507. 1906; Moldenke, Lilloa 5: 425. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37, 43, & 96. 1942; Moldenke, Alph. List Cit. 1: 12 (1946) and 2: 444 & 446. 1948; Moldenke, Lilloa 14: 44. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Alph. List Cit. 3: 837 (1949) and 4: 1072. 1949; Moldenke, Résumé 94, 125, & 462. 1959; Moldenke, Phytologia 12: 256 & 268. 1965.

Plant in all not over 20 cm. tall; stems incrassate, erect, slender, about 17 cm. tall, subterete, longitudinally costate, about 2 mm. thick, few-leaved, hirsute-villosulous, finally merely pubescent, issuing from a greatly thickened rhizome which is about 1 cm. thick, brown in drying; leaves small, decussate-opposite, subsessile; leaf-blades broadly ovate, subcoriaceous, to 2.5 cm. long and 2 cm. wide, very obtuse at the apex, penninerved or palmately 7-nerved, ciliate and crenate-serrate along the margins, villous-tomentose on both surfaces, pilose at the margins beneath; peduncles erect, 2.5--4 cm. long, about half as thick as the stems, subequaling or surpassing the subtending leaves, hirsute-villosulous; heads scarcely 1.5 cm. wide; bractlets rounded-ovate, short-cuspidate at the apex, pilose-pubescent on both surfaces, the outer ones about 1.1 cm. long and wide, the inner ones 0.6 cm. long and wide, many-nerved, ciliate-margined; calyx tubular, about 1.5 mm. long, deeply bilobed, white-villous, the lobes quadrangular-ovate, 2-nerved, smooth on the inner surface; corolla reddish-purple, the throat yellow, the tube somewhat incurved, about 9 mm. long, scarcely 1 mm. wide at the middle, ampliate at the stamen insertion, very slightly attenuate at the throat, conspicuously coarctate below, pubescent throughout on the outer surface, the limb about 1 cm. wide, with the posterior lobe entire, the anterior one larger, about 6 mm. wide; stamens included, inserted about 3 mm. above the base of the corolla-tube; anthers broad; style about 4 times as long as the ovary, strict, filiform, 2.2 mm. long, smooth; stigma lateral, equal to the ovary in length; ovary about 0.6 mm. long, ovoid, obsolete puberulent; ovules basal.

The type of this species was collected by Spencer la Marchant Moore (no. 189) in August on the summit of Serra da Chapada, Minas Gerais, Brazil. The collector says of it in his original description "Lippiae Gardnerianae, Schauer, proxima et ab ea distans statura humiliore, foliis villosotomentosis nex pubescenti-hirtis, bracteis minoribus pubescentibus aliisque signis."

The Archer & Gehrt s.n. [Herb. Inst. Bot. S. Paulo 36447], Herb. Rio de Jan. 31714, Löfgren 154, and Quiroga s.n. [Herb. Mus. Argent.

Cienc. Nat. 23852], distributed as this species, are actually L. lupulina Cham. Nothing is known to me of L. primulina in its typical form except what is stated in the bibliography.

LIPPIA PRIMULINA var. GOYAZENSIS S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 437. 1895.

Bibliography: S. Moore, Trans. Linn. Soc. Lond. Bot., ser. 2, 4: 437. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Moldenke, Castanea 10: 42. 1945; Moldenke, Alph. List Cit. 1: 223 (1946), 3: 693 (1949), and 4: 1078 & 1169. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; Moldenke, Phytologia 3: 287. 1950; Moldenke, Résumé 94 & 462. 1959.

This variety differs from the typical form of the species in its smaller bractlets, 6.5 mm. long and wide and the thicker style which is only twice as long as the ovary.

The type of the variety was collected by George Gardner (no. 3406) near Duero, Goiás, Brazil, deposited "in Herb. Brit. Mus. et Kew", an isotype in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva was photographed by Macbride as his type photograph number 24661.

Moore (1895) says of this taxon: "Hujus speciei varietatem legit beat. Gardner prope Duero in provincia Goyazensi, a typo discrepantem imprimis ob bracteas minores (0.65 cm. long. et lat.) et stylum crassiusculum, ovarium modo duplo excedentem." The corolla is described as pinkish by Baldwin and as rose by Macedo. The plant has been collected in anthesis in July and September. Baldwin describes the plant as "not common" in the Matto Grosso. Herbarium material has been misidentified and distributed as Lantana sp.

In all, 3 herbarium specimens and 3 mounted photographs, including phototype material, have been examined by me.

Citations: BRAZIL: Goiás: G. Gardner 3406 [Macbride photos 24661] (It--photo of isotype, Kr--photo of isotype, N--photo of isotype); Macedo 3640 (S). Matto Grosso: J. T. Baldwin 3012 (W--1834303). Minas Gerais: Macedo 1239 (N).

LIPPIA PRINGLEI Briq., Bull. Herb. Boiss., sér. 1, 4: 340. 1896.

Synonymy: Lippia jurgenseni Briq., Ann. Conserv. & Jard. Bot. Genève. 4: 239. 1900. Lippia jurgenseni Briq. ex K. Schum. in Just, Bot. Jahresber. 28 (1): 497. 1902. Lippia callicarpifolia var. briquetiana Loes. in Fedde, Repert. Nov. Sp. 9: 366. 1911. Lippia briquetiana Loes. ex Moldenke, Suppl. List Invalid Names 5, in syn. 1941. Lippia allantanifolia M. E. Jones ex Moldenke, Alph. List Invalid Names Suppl. 1: 13, in syn. 1947. Lippia allantanflora M. E. Jones, in herb.

Bibliography: Briq., Bull. Herb. Boiss., sér. 1, 4: 340. 1896; Briq., Ann. Conserv. & Jard. Bot. Genève. 4: 239. 1900; K. Schum. in Just, Bot. Jahresber. 28 (1): 497. 1902; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 106. 1904; Briq., Bull. Herb. Boiss., sér. 2, 4: 340.

1904; Loes. in Fedde, Repert. Sp. Nov. 9: 365--366. 1911; Loes., Verh. Bot. Ver. Brand. 53: 78 [Abhandl. 243]. 1912; A. B. Seymour, Host Ind. Fungi N. Am. 588. 1929; H. B. Davis, Life & Works Pringle 56, 668, & 669. 1936; Moldenke, Alph. List Common Names 8, 21, & 29. 1939; Moldenke, Suppl. List Invalid Names 5. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17, 80, & 96. 1942; Moldenke, Alph. List Invalid Names 30 & 31. 1942; H. S. Gentry, Carnegie Inst. Wash. Publ. 527: 223 & 306. 1942; Moldenke, Phytologia 2: 67, 85, & 107. 1945; Moldenke, Alph. List Cit. 1: 13, 118, 162, 215, 218, 232, 233, & 241. 1946; Moldenke, Alph. List Invalid Names 13. 1947; Moldenke, Phytologia 2: 383 & 387. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 66 & 77. 1948; Moldenke, Alph. List Cit. 2: 400, 468, 477, 539--542, 595, 601, & 604 (1948), 3: 685, 689, 693, 729, 730, 769, 780, 786, 788, 829--831, 833, 873, 919, & 921 (1949), and 4: 1073, 1180, 1209, 1211, 1236, 1237, 1245, 1246, 1254, 1290, 1295, 1298, & 1303. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31, 162, & 190. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Spec. Subsp. Cont. Mold. Set 45 p. [2]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 3 (1951), 49 Spec 2 (1954), and 51 Spec. 3. 1956; Moldenke, Résumé 37, 220, 310, 311, 313, & 462. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 160 & 1010. 1964; Moldenke, Phytología 12: 79, 109, 111, 112, 168, 190, 208, & 215. 1965.

Large symmetrical shrub or erect spreading symmetrical tree, to 15 m. tall, with heavy foliage; trunk to 30 cm. in diameter at breast height; bark light- or ashy-gray, rather smooth; leaves with a lemon-like odor; branchlets often fastigiate, densely appressed cinereous-pubescent; leaves decussate-opposite; petioles 1--2 cm. long, canescent; leaf-blades elongate, oblong-lanceolate, 8--20 cm. long, 3--9 cm. wide, very acute or acuminate at the apex, more convex toward the base and there rotund-cuneate, dark-green and pubescent above, pale-green or cinereous and densely tomentellous-pubescent beneath; venation penninerved, the lateral veins and veinlets parallel, perpendicularly joined, forming rectangular areoles in the parenchyma beneath and deeply sunken in the upper surface; the margins regularly serrulate with small closely set teeth 0.5--2 mm. high and 2--5 mm. apart, on the young leaves gibbous at the apex, the older ones more rounded; inflorescence regularly corymbosely paniculate, composed of beautifully pedunculate, numerous, axillary heads, whitish or greenish-white, the flower-clusters pale-green; peduncles 1.5--4 cm. long; heads small, 5--8 mm. wide during anthesis, many-flowered; outer bractlets ovate-triangular, 3.5 mm. long and 3 mm. wide, very slightly acuminate at the apex, beautifully venose, densely cinereous-pubescent, equaling the flowers; calyx small, membranous, obconic, 1 mm. long, densely long-pubescent on the outside, bilabiate, the lips subentire, 0.3--0.4 mm. long, rounded at the apex and with broadly obtuse sinuses; corolla exserted, hypocrateriform, varying from pale-orange, yellow, very pale-yellow, dull-golden, or yellowish-white to cream, dull-white, or white, said to open yellow and fade to cream-color, the tube 3 mm. long, cylindrical at the base and there 0.6 mm. wide, gradually ampliate toward the a-

pex and there 1.3 mm. wide, the throat inflated (especially below), the upper and lateral lobes subequal, 0.4--0.5 mm. long, about 0.9 mm. wide, the lowest lobe oblong-elongate, 1.5 mm. long and 0.9 mm. wide, eventually recurved-deflexed, rounded at the apex, more venose; nectaries none; stamens included; filaments and anthers glabrous, inserted at the middle of the corolla-tube; fruit small, dry, the pericarp hard, composed of 2 pyrenes, separable.

The type of this handsome species was collected by Cyrus Guernsey Pringle (no. 1733) in hollows of a barranca near Guadalajara, Jalisco, Mexico, in 1888, and is probably deposited in the Herbarium Boissier at Geneva. The type of *L. jurgenseni* was collected by C. Jurgensen (no. 431) at Rio de Taba, east-northeast of Oaxaca, in Oaxaca, Mexico, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where it was photographed by Macbride as his type photograph number 24655. Both species were named in honor of the collectors of the type specimen.

Cotypes of *L. callicarpifolia* var. *briquetiana* and of *L. briquetiana* were collected by Caecilia and Georg Eduard Seler (no. 4358) in hedges along roadsides at Ejutla, Oaxaca, Mexico, and by Rudolph Endlich (no. 1067) on volcanic soil with remnants of woods on Rancho Mirador, at an altitude of 1450 meters, at Chapultepec, near Cuernavaca, Morelos, Mexico, and were deposited in the herbarium of the Botanisches Museum at Berlin, now destroyed. The cheironymous names, *L. allantanifolia* and *L. allantanflora*, were apparently based on a collection made by Marcus Eugene Jones (no. 23423) at Tepic, Nayarit, Mexico, on February 14, 1927, typewritten on the labels, but never validly published by him.

Briquet (1898) says of his *L. pringlei*: "Ab inventore refertur *Lippia* haec pulcherrima cum dubio ad *L. callicarpaefolium* Kunth. Haec species differt autem tubo coelo capitulis quinquies ad decies majoribus globosis, bracteis magnis crebris membranaceis suffultis. *L. pringlei* nobis magis cum *L. umbellata* Cav. affinis videtur, quae capitulis ejusdem forma sed ter majoribus et foliorum forma et nervatione differt."

Loesener (1911) says concerning his *L. callicarpifolia* var. *briquetiana*: "Bracteis latioribus brevius vel vix acuminatis capitulis paullo maioribus fructiferis usque 12 mm diam. a typo recedens." Also, "Es erscheint mir nicht ausgeschlossen, dass nach genauerer monographischer Durchsicht eines reicheren Materiales und scharfer Festsetzung der Artengrenzung von *L. callicarpifolia* H.B.K. hier aufgestellte Varietät als besondere Art zu betrachten sein werde. Mit *L. bicolor* Kunth et Bouché hat auch sie trotz der grosseren Blütenkopfe jedenfalls keine spezifische Gemeinschaft."

The species has been found in fields, ravines, and barrancas, open places and thickets, narrow valleys and the valleys of small streams, woods, oak-pine forests, short-tree forests, deciduous woodlands, and pine forests on mountains, in rather wet spots in oak woods, in arroyos and open places on hillsides, dry rocky

places and brush along trails. It inhabits hills and hillsides, oak ridges and the slopes of barrancas, brushy slopes and precipitous rocky south-facing slopes, flat land near rivers, and shady canyon bottoms. It has been collected in meadow margins, at the edge of cornfields, and near water, at altitudes of 165 to 2000 meters, flowering and fruiting from September to April. McVaugh found it "abundant in oak-pine forest" in Jalisco; he and Koelz describe it as "abundant on hills among other trees" and "occasional here, more abundant and weedy in the valley below". Gentry (1942) describes it from "arroyo and canyon margins, Short-tree Forest and Oak Forest, 1500-3500 feet" in Sonora. He says "At Carimechi by the Rio Mayo a single, isolated, treelike shrub; at Curohui a spreading symmetrical tree 8-10 m. high, with light-gray bark. Flowers early spring. This is a tree of the canyons. The Warihios regard its medicinal qualities as particularly efficaceous; the sap is used for toothache; the leaves after being steeped in hot water are coated with mentholatum, other ointment, or grease and applied to bruises, sores, headaches, etc." He also describes it as from arroyos in the Lower Sonoran Zone in Sonora.

The flowers are described as "yellow" on Hinton 11717; "yellowish-white" on J. Gonzalez Ortega 5707; "very pale-yellow" on McVaugh 15335; "yellow or cream" on R. S. Ferris 5907; "pale-orange" on Hinton 13482; "dull-golden" on McVaugh & Koelz 673; "dull-white" on McVaugh & Koelz 840; "white" on Galeotti 768, Hernandez Yolocotzi 125, and Hinton 11278; and "open yellow, fade cream" on E. J. Alexander 358.

Vernacular names recorded for the species are "bacaton", "bacatón", "batayaqui", "batayáqui", "choila", "chokili", "matayaki", "matayali", "mucuay", "nacare", "nacari", "nacavé", "palo blanco", "tabaquilla", "tabaquillo", "talabáo", "talakao", "tecote", and "vara blanca".

It is attacked by the following fungi: Nephlyctis conjuncta (Dietr. & Holw.) Arth. [Puccinia conjuncta Dietr. & Holw.], Prosopidium lippiae (Speg.) Arth. [Puccinia lippiae Speg.], Uredo lippiae Dietr. & Holw. (1901), and U. lippiae Speg. (1898). The J. Gonzalez Ortega 463 and 1132 from "San Ignacio, Ajoia" and "San Juan" may be from either Sinaloa or Nayarit. Edw. Palmer 479 was previously identified both as L. callicarpaefolia H.B.K. and L. umbellata Cav. Standley says of Purpus 8206, identified originally as L. callicarpaefolia, "I should call it a form of L. umbellata Cav." English reports that the wood of this plant is used as firewood.

Material of L. pringlei has been misidentified and distributed in herbaria under the names L. callicaepaefolia H.B.K., L. callicarpaefolia H.B.K., L. callicarpifolia H.B.K., L. floribunda H.B.K., L. gentryi Standl., L. graveolens H.B.K., L. hirsuta Mutis, L. microcephala Schlecht., L. tepicana Moldenke, L. umbellata Cav., Buddleia sp., and Brickellia sp. On the other hand, the Wiggins

13187, distributed as L. pringlei, is actually L. gentryi Standl.

In all, 249 herbarium specimens and 6 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: MEXICO: Aguascalientes: J. Gonzalez Ortega 216 (Me, Me). Durango: Edw. Palmer 479, in part (Me). Guerrero: D. S. Correll 14396 (Rf); Hinton 11278 (Mi, N, W--2020401), 11717 (G, La, N, N); Edw. Palmer 479, in part [Acapulco, Oct. 1894--March 1895] (A, C, Ca--104932, G, Mi). Jalisco: Diquet s.n. [Decembre 1899] (N); Galeotti 787 (Br); R. McVaugh 11788 (Mi), 14335 (Mi); Mexia 1354 (A, Ca--350251, Du--195381, Gg--157210, Gg--282789, La, Mi, N); Pringle 1733 (A--isotype, A--isotype, Br--isotype, C--isotype, Ca--104937--isotype, F--photo of isotype, G--isotype, N--photo of isotype, Pa--isotype, S--isotype, Si--photo of isotype, Vt--isotype, Z--photo of isotype), 2743 (Ca--104931, Me, Me, Ob--50724), 11088 (G, I, Mi, S, Vt), 11669 (G, Gg--421283, It, Mi, Rf), s.n. [4.XII.1902] (S); Purpus 508 (Po--64302). México: Hinton 315 (N), 2330 (A, N), 2574 (N), 2921 (A, N, N), 7237 (N), 13482 (La); Matuda 27854 (Cb), 29867 (Ss), 30505 (Ss). Michoacán: Arsène 5293 (A, Cm, G, N, S, Ur); J. H. Hill 32 (Mi); Hinton 12949 (Au--121219, N, Oa--6697, Rf), 13482 (Au, G, It, Mi, N, Rf), 13614 (Au, N, Oa--8820, Rf); E. W. Nelson 6838 (G, N); Purpus 508 (Ca--139663). Morelos: Bourgeau 1217 (Br, G, S); Fröderström & Hultén 85 (G, N, S); Lyonnet & Elcoro 1166 (W--1745976); J. Mann 8 (N, W, Z); Moldenke & Moldenke 19830 (B, Es, F, Fy, Hw, Lg, Lm, Mg, Mr, N, No, Ot, Rs, S, Sm, Ss); Pringle 11087 (Cm, G, Gg--421285, It, Me, Me, Mi, N, Vt), 13982 (Au--181668, Ca--168242, G, Gg--421284, Mi, Mi, S, St, Vt); Seler & Seler 4337 (G, Gg--245896). Nayarit: R. S. Ferris 5796 (Du--185340), 5907 (A, Du--185339); J. González Ortega 463 (Me, Me), 1132 (Me); M. E. Jones 23423 (Ca--400555, N, Po--191957); McVaugh & Koelz 673 (Mi), 840 (Mi); Edw. Palmer s.n. [Tepic, Jan.--Feb. 1892] (S). Oaxaca: E. J. Alexander 358 (N, N, N, N, N, N, N, W); Chico s.n. [Chonta] (N); C. Conzatti 2343 (G), 3866 (Me); Conzatti & Conzatti 4857 (Mi); Conzatti & Gonzalez 526 (G, Me); Galeotti 768 (Br), 795j (Br, Br, G, N); Holway 3719 (G); Jurgensen 431 [Macbride photos 24655] (Kr--photo, N--photo, N--photo); E. W. Nelson 1840 (G); Seler & Seler 1460 [Macbride photos 17497] (Du--283956, G, G--photo, Gg--245940, Kr--photo, N--photo), 1743 (Du--283957, G, Gg--242725, Gg--245938), 4358 (G, Gg--245939); C. L. Smith 218 (Ca--975393, N). Sinaloa: J. González Ortega 351 (Me), 937 (Me), 1135 (A, Ca--406441, Du--173152, Du--192867, G, G, Io--140357, Me, Me, Po--192872, W--1532917), 6548 (Du--173142, G), 7125 (Gg--231570); Mexia 458 1/2 (Ca--367620, Gg--142080); Edw. Palmer 1199 (Ca--104947, G, Mi, N, N, S); Rose, Standley, & Russell 14798 (N); C. L.

Smith 271 (G). Sonora: H. S. Gentry 1179 (A, Ca--646236, Fs, Ge, I, Me, Me, Mi, N, N), 2037 (A, Fs, Ge, I), 3669 (A, Ca--602695, Fs, Ge), 4814 (Ca--652119, Du--274254, G, Ge, Me, Mi, N). Vera Cruz: Purpus 8206 (A, Ca--200697, G, N, S). State undetermined: Chico s.n. (N); Collector undesignated 1063 (Me), s.n. (F--842569); C. Conzatti s.n. (Me). CULTIVATED: Germany: Karwinski s.n. (Br, Br).

LIPPIA PRINGLEI f. INTECTA Moldenke, Phytologia 9: 99. 1963.

Bibliography: Moldenke, Phytologia 9: 99. 1963; Moldenke, Résumé Suppl. 6: 4. 1963; Moldenke, Biol. Abstr. 43: 643. 1963; Hocking, Excerpt. Bot. A.7: 454. 1964.

This form differs from the typical form of the species in having the lower leaf-surface merely very short-puberulent with rather distant hairs.

The type of the form was collected by Efraim Hernández Xolocotzi (no. 125) at El Llano, south of San Blas, Nayarit, Mexico, on January 7, 1944, and is deposited in the herbarium of the Texas Research Foundation at Renner, Texas. The plant is said to be a tree 3--6 meters tall, with white flowers, and is called by the natives "tacote". It is known thus far only from the type collection, of which 3 herbarium specimens have been examined by me.

Citations: MEXICO: Nayarit: Hernández Xolocotzi 125 (Mi--isotype, Rf--type, Z--isotype).

LIPPIA PSEUDO-THEA (A. St.-Hil.) Schau. in A. DC., Prodr. 11: 582. 1847.

Synonymy: Lantana pseudo-thea A. St.-Hil., Plant. Usuel. Bras. pl. 70, pp. 1--3. 1824--1828. Lantana pseudothea A. St.-Hil. apud Spry, Useful & Ornament. Pl. India 31. 1841. Lippia pseudo-thea Schau. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894. Lippia pseudothea Schau. ex Moldenke, Résumé Suppl. 10: 6, in syn. 1964. Lippia pseudo-thea Leut. ex Moldenke, Résumé Suppl. 10: 6, in syn. 1964.

Bibliography: A. St.-Hil., Plant. Usuel. Bras. pl. 70, pp. 1--3. 1824--1828; Spry, Useful & Ornament. Pl. India 31. 1841; Presl, Wseobecny Rostlinopsis 2: 1203. 1846; Schau. in A. DC., Prodr. 11: 582. 1847; Lindl., Med. & Oeconom. Bot. 223. 1849; Schau. in Mart., Fl. Bras. 9: 233. 1851; Bocq., Adansonia 3: 244. 1863; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 541. 1911; Gerth van Wijk, Dict. Plantnames 2: 466 & 4491. 1916; Moldenke, Alph. List Common Names 12 & 30. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 37 & 96. 1942; Stellfeld, Os Binom. Drog. Veg. Micro-biog. Aut. 134. 1943; Darlington & Janaki Ammal, Chromosome Atl. 271. 1945; Moldenke, Phytologia 2: 69, 70, 72, 85, & 107. 1945; Moldenke, Alph. List Cit. 1: 238. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 12 & 15. 1947; Hager in Reickert, Trat. Farmac. Práct. 5: 790. 1948; Moldenke,

Alph. List Cit. 2: 486 (1948) and 3: 726 & 731. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 190. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Hocking, Dict. Terms Pharmacog. 283. 1955; Mendes Magalhães, Anais V Reun. Anual Soc. Bot. Bras. 282--283. 1956; Moldenke, Résumé 94, 306, 316, & 462. 1959; Rennó, Levant. Herb. Inst. Agron. Minas 150. 1960; Moldenke, Résumé Suppl. 10: 6. 1964; Moldenke, Phytologia 12: 24, 87, 141, & 280. 1965.

Illustrations: A. St.-Hil., Plant. Usuel. Bras. pl. 70. 1824--1828.

Shrub, 0.5--1.5 m. tall, erect, with the odor of turpentine, the younger parts viscid with glanduliferous hairs; stems simple or few-branched above, floriferous at the apex; branches subterete; leaves decussate-opposite or ternate, approximate, sessile; leaf-blades rather rigid, lanceolate or oblong, 2.5--5 cm. long, resembling those of Salix repens L., acute at the apex, rounded or subcuneate and entire at the base, serrulate along the margins from the middle upwards, penninerved, venose, rugose above with impressed venation, shiny and roughened above and appressed-strigose with papulose hairs, shortly canescent-tomentose or strigose-hirsutulous beneath with the prominent reticulation sparsely strigose or hirsute, the young leaves viscid, the adult ones eglandular and scabrous with the persistent bases of the hairs; inflorescence axillary; peduncles solitary, equaling or surpassing the subtending leaves, glandular-viscid; heads hemispheric, glandular-viscid; bractlets lanceolate, acute at the apex, equaling the corolla-tube, strigose-hirtous and glandular-pubescent on the back; calyx very short, bifid, lightly pubescent, finally splitting into 2 small scales; corolla hypocrateriform, deep-pink or rose to violet, its tube about 4 mm. long, rather straight, slender below, gradually ampliate and pubescent upwards, the limb oblique, 4-parted, the lobes retuse at the apex, the lowest one enlarged.

This very distinct species was based on a specimen collected by August François Cesar Prouvençal de Saint-Hilaire among quartz rocks on the Serra do Cadonga near the town of Tapanhoacanga, Minas Gerais, Brazil. Schauer (1851) cites also another collection by him from the Admantu district in the same state, and a Sellow collection ("loco non allato"), and says of the species "Affinis L. pumilae et nanae ab utraque tamen bene distincta."

Saint-Hilaire (1824--1828) says "Cette espèce est commune sur la Serra de Cadonga, auprès du bourg de Tapanhoacanga dans la province de Minas Geraes, où el végète au milieu des rochers quartzeux; on la trouve aussi dans le district des diamans. Elle fleurit au mois de mars."

The Sellow s.n. [Brasilia] specimen in the University of Vermont herbarium, identified as L. pseudo-thea, proves to be L. archavaletae Moldenke. The Campos Novaes 930, also distributed as L. pseudo-thea, is actually L. salviaefolia Cham., while Regnell s.n. [Herb. Mus. Nac. Rio Jan. 14857] is L. corymbosa Cham.

Schauer (1847) classifies this species in his Section Zapania,

Subsection Axilliflorae. It has been collected on sandy campos, at 1260 meters altitude, flowering from March to June. Mexia calls it "frequent, scattered, in disintegrated rock between crags". The corolla is described as "deep-pink" on Mexia 5749, "rose" on Brade 13908, and "violet" on Mendes Magalhães 1802.

Vernacular names reported for it are "camara", "camara faux thé", "capitao do mato", "capitão do matto", "capitão do matto", "cha de pedreste", "chá de pedreste", "faux thé", and "thé de piéton".

Lindley (1849) notes that this plant is aromatic and fragrant, used in the treatment of coughs, rheumatism, and medicated baths. When dried it forms an agreeable tea. Hocking (1955) reports that the leaves have a volatile oil used as an antipyretic, diaphoretic, and tea substitute, and that the fruit is edible. Hager (1948) says "Extracto fluido do lippia. Extractum Lippiae fluidum. Brasil: 1000 gr. de la droga en polvo III para 1000 cc. de extracto fluido, por el método B (v. éste) con mezcla de 100 cc. de glicerina, 250 cc. de alcohol (92% en peso) y 650 cc. de agua como menstruo I, y mezcla de 1 vol. de alcohol y 3 vol. de agua como menstruo II. -- Jarabe de lippia. Siripus Lippiae. Brasil: 50 cc. de extracto fluido; c. s. de jarabe simpla para 1000 cc."

In all, 10 herbarium specimens have been examined by me.

Citations: BRAZIL: Minas Gerais: Brade 13908 [Herb. Rio de Jan. 29536] (B); Glaziou 19709 (Br, N); Mello Barreto 9649 (Ja--32308); Mendes Magalhães 1802 (Be--14563); Mexia 5749 (Gg--286574, Go, N, S, W--1618223).

LIPPIA PUMILA Cham., Linnaea 7: 218. 1832.

Bibliography: Cham., Linnaea 7: 218. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 597. 1843; Walp., Repert. Bot. Syst. 4: 45. 1845; Schau. in A. DC., Prodr. 11: 582. 1847; Schau. in Mart., Fl. Bras. 9: 234. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 95. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 541. 1911.

BOOK REVIEW

Alma L. Moldenke

"Ecology of Soil-borne Plant Pathogens - Prelude to Biological Control", edited by Kenneth F. Baker & William C. Snyder, 571 pp., illustr. University of California Press, Berkeley 4, California. 1965. \$12.00

The included 41 interdisciplinary papers were presented at the first International Symposium on Factors Determining the Behavior of Plant Pathogens in Soil, which was held at the University of California in the spring of 1963. Also included are the